

BHUTAN

COUNTRY ECONOMIC MEMORANDUM



Maximizing Bhutan's Potential for Economic
Diversification and Structural Transformation



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Bhutan Country Economic Memorandum

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Diversification and Structural Transformation**



Macroeconomics, Trade and Investment (MTI) Global Practice

SEPTEMBER 2024

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Abbreviations and Acronyms

AED	Agriculture Engineering Division	CSI	Cottage and Small Industry
ATM	Automated Teller Machine	DD	Dutch Disease
B2B	Business to Business	DEA	Data Envelopment Analysis
BAU	Business-As-Usual	DGPC	Druk Green Power Corporation
BCC	Bhutan Care Credit	DHI	Druk Holding and Investments
BDB	Bhutan Development Bank	ECB	External Commercial Borrowing
BESF	Bhutan Economic Stabilization Fund	EEC	Eastern Economic Corridor
BIG	Basic Income Grant	EPZ	Export Processing Zone
BIL	Bhutan Insurance Limited	ESG	Environmental, Social, and Governance
BLFS	Bhutan Labour Force Survey	ESSF	Economic and Social Stability Fund
BNB	Bhutan National Bank	EVI	Environmental Vulnerability Index
BoB	Bank of Bhutan	EWI	Early Warning Indicator
BRER	Bilateral Real Exchange Rate	FAO	Food and Agriculture Organization of the United Nations
BTN	Bhutanese Ngultrum	FDI	Foreign Direct Investment
C4CS	Committee 4 Coordinating Secretaries	FI	Financial Institution
CAD	Current Account Deficit	FINAP	Financial Inclusion National Action Plan
CAR	Capital Adequacy Ratio	FYP	Five-Year Plan
CBDC	Central Bank Digital Currency	G2C	Government to Citizens
CCDL	Dungsam Cement Company Limited	GDP	Gross Domestic Product
CCDR	Country Climate and Development Report	GHG	Greenhouse Gas
CDCL	Construction Development Corporation Limited	GLC	Government-Linked Company
CDP	United Nations Committee for Development Policy	GLOF	Glacial Lake Outburst Flood
CEM	Country Economic Memorandum	GNH	Gross National Happiness
CGE	Computable General Equilibrium	GNHC	Gross National Happiness Commission
CGRR	Corporate Governance Rules and Regulations	GNI	Gross National Income
CIAT	International Center for Tropical Agriculture	GoI	Government of India
CIB	Credit Information Bureau	GRI	Global Reporting Initiative
CIT	Corporate Income Tax	HAI	Human Assets Index
CMIP5	Coupled Model Inter-comparison Project Phase 5	HS	Harmonized Classification
		ICAAP	Internal Capital Adequacy Assessment Process
		ICMA	International Capital Market Association
		IEU	Investment Evaluation Unit

IFPRI	International Food Policy Research Institute	OCASC	Office of the Cabinet Affairs and Strategic Coordination
IFRS9	International Financial Reporting Standard-9	ODA	Official Development Assistance
ILAAP	Internal Liquidity Adequacy Assessment Process	P2P	Peer to Peer
IMF	International Monetary Fund	PCA	Prompt Corrective Action
INR	Indian Rupee	PER	Public Expenditure Review
IPCC	Intergovernmental Panel on Climate Change	PES	Payment for Ecosystem Services
IPO	Initial Public Offering	PHC	Population and Housing Census
IT	Information Technology	PIM	Public Investment Management
JV	Joint Venture	PPP	Public-Private Partnership
KPI	Key Performance Indicator	PRF	Pension Reserve Fund
KRI	Key Risk Indicator	PSL	Priority Sector Lending
KWAN	Kumpulan Wang Amanah Negara	R&D	Research and Development
LAYS	Learning Adjusted Years of Schooling	RGoB	Royal Government of Bhutan
LDC	Least Developed Country	RICB	Royal Insurance Corporation of Bhutan
LLC	Limited Liability Company	RMA	Royal Monetary Authority
LPI	Logistics Performance Index	RNR	Renewable Natural Resources
MFI	Microfinance Institutions	RoA	Return on Assets
MoAF	Ministry of Agriculture and Forests	RSEB	Royal Stock Exchange of Bhutan
MoESD	Ministry of Education and Skills Development	RTGS	Real-Time Gross Settlements
MoICE	Ministry of Industry Commerce and Employment	SAM	Social Accounting Matrix
MSME	Micro, Small, and Medium Enterprise	SAR	South Asia Region
MYR	Malaysian Ringgit	SDF	Sovereign Development Fund
NAS	Statistical National Accounts	SEZ	Special Economic Zone
NBFI	Non-Banking Financial Institution	SME	Small and Medium Enterprise
NCGS	National Credit Guarantee Scheme	SOE	State-Owned Enterprise
NCSI	National CSI Development Bank	SOFI	State-Owned Financial Institution
NDB	National Development Bank	SWF	Sovereign Wealth Fund
NGFS	Network for Greening the Financial System	TFP	Total Factor Productivity
NPL	Non-Performing Loan	TVET	Technical and Vocational Education and Training
NPPF	National Pension and Provident Fund	UAE	United Arab Emirates
NRF	National Resilience Fund	UN	United Nations
NSB	National Statistics Bureau	UNCTAD	United Nations Conference on Trade and Development
		WB	World Bank
		WDI	World Development Indicators



Executive Summary

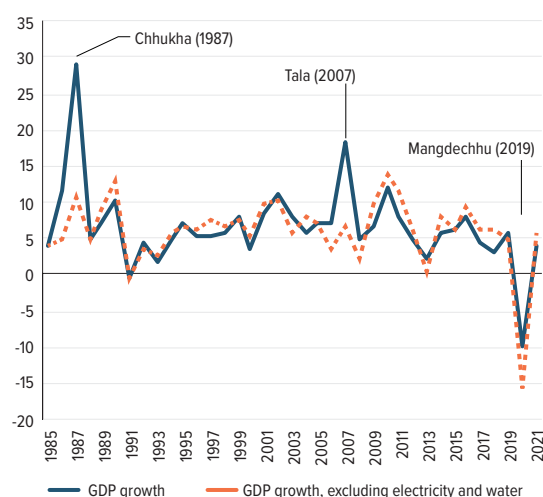
Bhutan has made significant strides in diminishing poverty and advancing human development, supported by strong economic growth and its unique development approach.

Bhutan's economy is intricately linked to its geography, mountainous landscape, and its special relationship with India. Situated deep in the eastern Himalayas, Bhutan is a small landlocked country that shares borders with India to the south, east, and west, and with China to the north. Bhutan has capitalized on its mountainous topography and abundant water resources to develop and export hydroelectric power, a sector that has grown since the mid-1980s with significant support from the Government of India (GoI). Despite these advantages, Bhutan contends with high transportation and trade costs that hinder access to international markets. The challenges of providing infrastructure and services are amplified by its small population of around 800,000 and the difficulty in achieving economies of scale.

The country's pursuit of Gross National Happiness (GNH) reflects a unique development strategy that prioritizes the well-being of its citizens and the environment. This philosophy underpins a commitment to sustainable and equitable socioeconomic growth. Bhutan's environmental stewardship and sustainable development initiatives have earned it recognition as a leader in climate change. With nearly half of its territory under protection to safeguard its rich biodiversity and forest cover exceeding 70 percent, Bhutan stands out as one of the few nations with a negative carbon footprint.

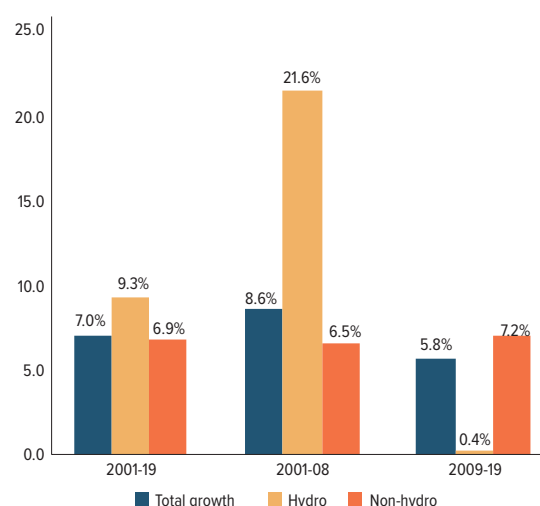
Over the past two decades, the country has experienced high real GDP growth, averaging 7 percent from 2001 to 2019, supported by the hydropower sector. Hydropower plays a significant role in the economy, contributing for more than a third of goods exports and domestic revenues, and constituting 16 percent of GDP in 2021.¹ Since the inauguration of the first large hydropower project in 1987 (Chhukha), Bhutan's installed hydropower capacity has increased seven-fold, reaching 2,326 MW. The Tala and Mangdechhu projects, commissioned in 2007 and 2019 respectively, are among the largest projects (Figure 20). Notably, periods of high GDP growth have coincided with the commissioning of major hydropower projects (Figure 1). However, the growth in the hydro sector was considerably higher from 2001 to 2008, at 21.6 percent, compared to a mere 0.4 percent between 2009 and 2019. (Figure 2).

Figure 1: Impact of hydropower on GDP (percent), 1985–2021



Source: National Statistics Bureau.

Figure 2: Growth rates of hydropower and non-hydropower sectors (percent), 2001–2019



Source: Penn World Table, World Bank staff calculations.

¹ This excludes the construction sector, which is partly hydropower construction. The agriculture sector accounts for 19 percent of GDP, the industry sector (including hydro) for 34 percent, and the service sector for 47 percent of GDP in 2021. Measures in current prices.



Bhutan has achieved impressive gains in economic growth and reducing poverty over the past two decades. From 1980 to 2021, GDP per capita expanded at a relatively high rate of 6.3 percent annually. By 2021, Bhutan's GNI per capita reached US\$3,040, bringing the country close to the World Bank's threshold for upper-middle-income status. Extreme poverty based on \$2.15/day was eliminated by 2022, and the population living below the \$6.85/day, poverty line for upper-middle-income countries, decreased from 39.5 percent to 8.5 percent between 2017 and 2022, despite the challenges posted by the COVID-19 pandemic, although Bhutan had one of the lowest infection rates in the South Asia Region (SAR).² The Gini index, which measures income inequality, declined from 37 in 2017 to 28 in 2022. Despite these achievements, Bhutan still faces significant challenges related to vulnerability to poverty and spatial inequality.

The country has also made substantial progress in human development. Bhutan's hydropower revenue has funded significant improvements in education and healthcare, and access to basic utilities. The country has achieved nearly universal primary school enrollment, increased literacy rates from 55.5 percent in 2005 to 70.6 percent in 2022, achieved universal access to electricity since 2019, and attained nearly universal access to piped water by 2022. These accomplishments are particularly notable given the logistical challenges posed by Bhutan's topography and scattered population, which make public service delivery more costly. However, issues persist in service quality and equitable access, especially in higher education.³

Despite these stellar achievements, structural transformation has been slow and job opportunities have been limited, especially for the educated and youth.

The non-hydro economy is predominantly service-oriented, complemented by a narrow range of resource-intensive manufacturing industries. Annual non-hydro sector growth averaged 6.9 percent from 2001 to 2019, driven by services and non-hydro industry. The service sector, which constituted 47 percent of GDP in 2021, has been a key growth driver, with public administration (including health and education), trade, transport, and the financial sector (including real estate) contributing significantly. Since the beginning of tourism in 1974, Bhutan has strategically focused on attracting high-value tourists to mitigate environmental impacts. The hotel and restaurant industry, excluding the pandemic year, grew at an impressive average rate of 16 percent annually between 2001 and 2019. The non-hydro industry, accounting for 19 percent of GDP, primarily comprises construction and manufacturing industries like ferro-alloy and ferro-silicon. Agriculture accounted for 19 percent of GDP in 2021 and remains vital for nearly half the population, especially the rural poor, who depend on it for their livelihoods.

Productivity gains have been limited, with labor predominantly employed in the low productivity agricultural and public sectors. The share of agriculture in GDP has significantly declined, and the share of services has increased from 37 to 50 percent. The contribution of the non-hydro industry sector, excluding electricity, has remained relatively stable at about 25 percent before the COVID-19 pandemic. Despite the decreasing share of agriculture, the labor force continues to be largely confined to the agricultural sector. In 2022, the labor market was mostly dominated by low-productivity agricultural employment (40 percent), followed by the public sector (25 percent, including education and health). Although more productive sectors like electricity, transport and communication, financial intermediation, and mining, have experienced an increase in their share of total employment between 2013 and 2022, they still have a relatively small presence in terms of employment. Sectors like construction have grown but have lower productivity levels compared to smaller and slowly growing sectors.

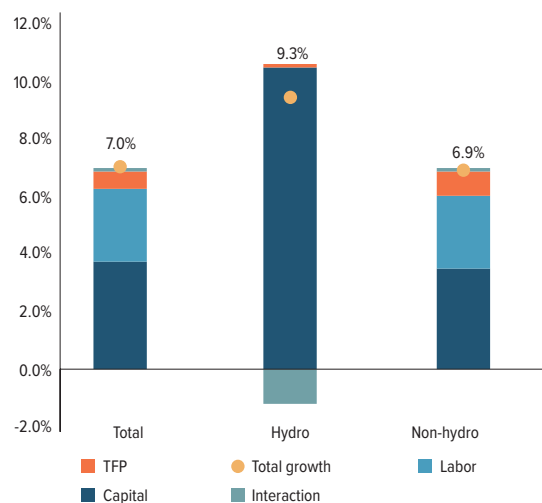
Over-reliance on hydropower has hampered economic diversification and job creation. The hydropower sector has contributed significantly to the economy, but its capital-intensive nature has provided limited employment opportunities, employing less than 1 percent of the labor force. The reliance on foreign labor, as well as machinery and raw material imports for hydropower projects, has led to minimal direct spillover effects on the non-hydro economy (**Figure 4**).⁴ But with rising hydro investments since 2009, the spillover has contributed 2.1 percentage points to the 7.2 percent growth

² Forthcoming World Bank Poverty and Equity Assessment.

³ WBG Country Partnership Framework (CPF) FY21-24 discussed by the Board on January 14, 2021 (Report No. 154927-BT); World Bank Bhutan Systematic Country Diagnosis (SCD), 2020.

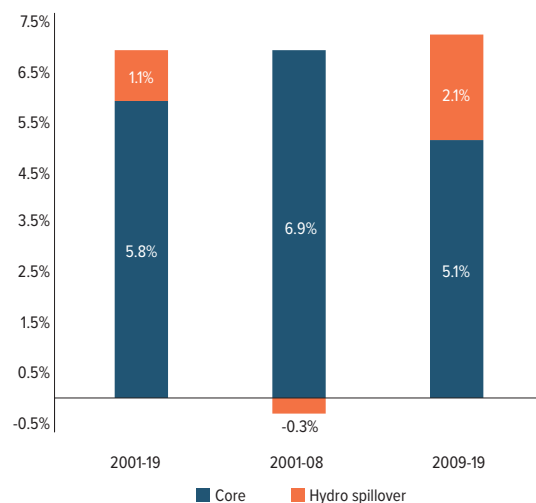
⁴ To quantify the effect of hydro sector investments on the growth of the non-hydro sector, it is assumed that the hydro sector's capital expenditures generate income in the non-hydro sector through the supply of goods (e.g., construction materials) and services (e.g., labor used in construction). The incremental growth of the non-hydro sector is then assessed by comparing its actual output against a counterfactual scenario where hydro sector investments are absent. See Annex 1 for more details on the calculation of hydropower spillovers.

Figure 3: Hydro and non-hydro sector growth decomposition (contribution to growth), 2001-2019



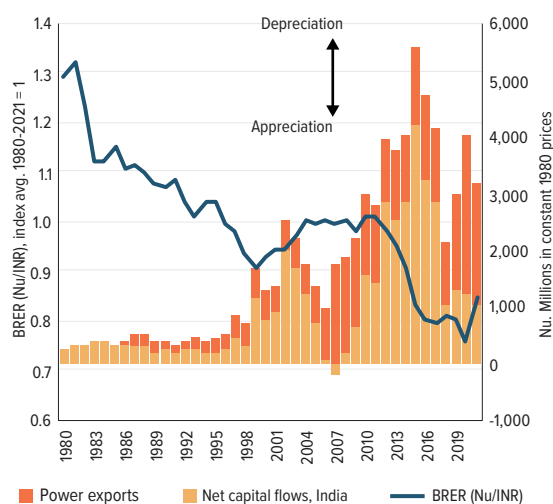
Source: Growth accounting, World Bank staff calculations.

Figure 4: Spillovers from hydro to non-hydro sector, 2001-2019



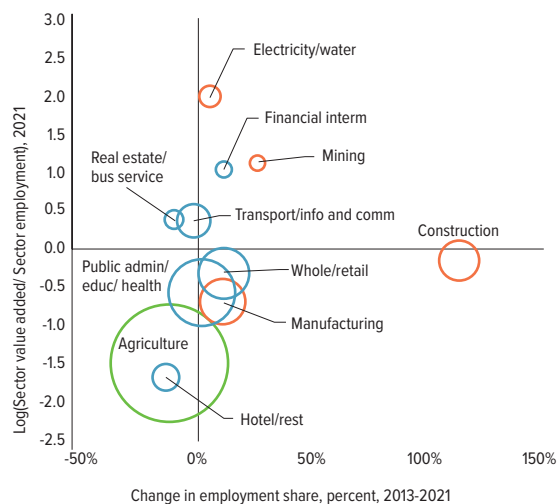
Note: To assess spillovers from the hydro to non-hydro sector, the non-hydro sector output is split into a core and hydro-driven part. See Annex 1 for more details.

Figure 5: Bilateral real exchange rate with India (Index average 1980-2021 = 1), real power exports and real capital inflows from India, 1980-2021



Source: National Statistics Bureau and World Bank staff calculations.

Figure 6: Change in sectoral productivity and employment shares, 2013-2021



Source: National Statistics Bureau and World Bank staff calculations.

Note: The size of each circle reflects sector employment in 2021. Productivity is measured as the sector-level value-added, per worker in 2021.

recorded by the non-hydro sector in the second period. Growth in the non-hydro sector has been driven by both capital and labor inputs, but contributions from productivity improvements have been limited. Human capital has been the dominant growth driver, though its contribution has declined over time. Changes in labor force participation have had a minimal impact on non-hydro sector growth. The private sector remains relatively small, with jobs concentrated primarily in agriculture, followed by the public sector (**Figure 6**).⁵

⁵ Agriculture accounted for 43 percent of employment in 2022, followed by services (41 percent), and the industry sector (15 percent).



Large foreign currency inflows during the construction and export phase of hydropower projects caused the real exchange rate to appreciate, negatively impacting the competitiveness of the non-hydro sector (Figure 5). This phenomenon, known as the Dutch Disease, is similar to the effects observed in resource-rich economies. While hydro exports generally avoid certain oil-related symptoms (i.e., shocks after resource depletion, volatile tariffs, and competition for a fixed amount of resources), the expansion of hydropower production in Bhutan shares characteristics with the discovery of fossil reserves since it involves large inflows of foreign currency. In Bhutan, the output of the tradable sector, including agriculture, mining, and manufacturing, has remained below the non-tradable sector and the booming electricity sector. Growth in non-hydro exports has been driven by mineral products such as boulders and base metals, while other exports have shown limited progress, indicating a lack of economic diversification. This suggests that hydropower exports and hydro-related capital inflows may have impeded the growth of the lagging tradable sector relative to the non-tradable sector.

There is significant scope for the private sector, which is largely comprised of low-productivity microenterprises, to diversify and grow.

To diversify beyond hydropower and generate employment, Bhutan has promoted a development strategy that emphasizes environmental sustainability, with a focus on major investment projects through state-owned enterprises (SOEs). The Government has attempted to promote economic diversification through various initiatives that support sustainable growth in sectors such as organic farming, green industry and manufacturing, and sustainable tourism. SOEs have played a significant role in providing critical infrastructure services and developing strategic sectors to support economic diversification. More recently, the state holding company Druk Holding and Investments (DHI) has made a substantial national investment in cryptocurrency mining to accelerate digital transformation and create new revenue streams. Furthermore, Bhutan has launched an ambitious initiative, the Gelephu Mindfulness City project, aimed at transforming the southern city Gelephu into a Special Administrative Region that emphasizes 'mindfulness', mirroring the unique Bhutanese identity and fostering the establishment of conscious and sustainable businesses that are in line with the values of GNH.

In contrast to the SOE sector, the private sector has remained small and is largely comprised of low-productivity microenterprises, with limited dynamism, diversification, and productive job opportunities. In 2022, only 2.7 percent of firms were new, indicating a lack of entrepreneurial activity. Very small firms tend to remain small, likely due to restrictions on growth, and inefficient firms do not exit. Between 2018 and 2022, firms became older and smaller, with the share of long-established firms increasing from 24 percent to 26 percent, and the share of cottage firms rising from 89 percent to 96 percent.⁶ Most firms (nearly 97 percent) are owned as individual proprietorships. In terms of employment, the average number of workers hired by firms decreased from 1.1 in 2019 to 0.7 in 2020 and 2021, indicating declining job opportunities in the private sector. Wholesale and retail trade, and accommodation and food services sectors account for nearly 80 percent of firms, indicating a lack of economic diversification.

Compared to the public sector, the private sector employs more low- and middle-paying occupations, leading to fewer employment opportunities and high unemployment for the educated workforce. Private employment is most prevalent in construction (60 percent), administrative and support service activities (60 percent), and arts, entertainment, recreation and other service activities (66 percent). Most employed workers are in low to mid-skilled positions, creating relatively few opportunities for educated job seekers. In 2022, approximately 58 percent (24 percent) of job seekers held a secondary degree (university degree), compared to 29 percent (9.5 percent) of employed workers, indicating an oversupply. As a result, unemployment rates are high for individuals with a secondary diploma (11.5 percent in 2022) and a tertiary diploma (11.8 percent in 2022). The lack of productive jobs that offer competitive wages for educated individuals is likely contributing to emigration, especially among the most skilled workers, including those employed in the public sector.

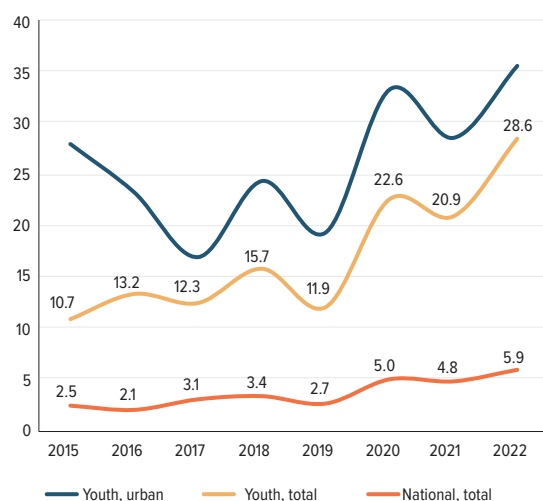
⁶ The Ministry of Industry, Commerce and Employment defines cottage-scale industries as those industries, whose initial fixed capital investment is less than Nu1 million and employ up to 4 people.

The COVID-19 pandemic and the global impact of geopolitical crisis have disrupted Bhutan's growth trajectory and exacerbated structural challenges.

The pandemic highlighted the country's vulnerability to external shocks and structural challenges. The COVID-19 pandemic had a significant impact on Bhutan's economy, causing a contraction of 2.5 and 3.3 percent in FY19/20 (June 2019 to July 2020) and FY20/21.⁷ The hydropower sector experienced positive growth, due to the commissioning of the Mangdechhu hydropower plant in 2019, but the non-hydro industry and services sectors were adversely affected. Disruptions in supply chains, shortages of foreign labor, and a decline in tourism-related activities led to a contraction of 7.8 and 5.9 percent in industry in FY19/20 and FY20/21, respectively, and 1.2 percent in the services sector in FY20/21. Despite these challenges, Bhutan has graduated from the United Nations' (UN) Least Developed Country (LDC) status in 2023. However, it did not meet the LDC graduation threshold for economic and environmental vulnerability.

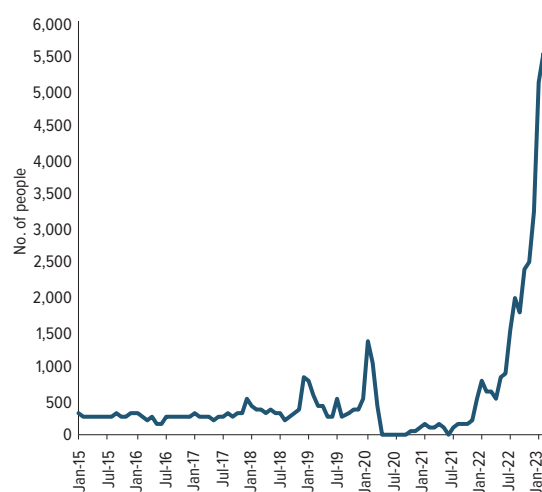
Unemployment has surged since the COVID-19 pandemic, and emigration has increased. Unemployment rates in Bhutan rose from an average of 2.8 percent between 2015 and 2019, to 5.9 percent in 2022, with urban areas, and particularly young and educated individuals, experiencing the highest increase (Figure 7).⁸ According to media reports, the average number of Bhutanese emigrating increased significantly with the reopening of the borders in mid-2022, to more than 5,000 per month in early 2023 compared to less than 500 per month before the pandemic (Figure 8).⁹ Various factors may have contributed to the surge in emigration, including push factors such as limited job opportunities. Vacancies in the civil service, the biggest employer in Bhutan, have also been increasing in recent years. Pull factors, including relaxed visa restrictions by Australia to address its labor market challenges and social pressure to follow successful migrants, may have also played a role. This has raised concerns about brain drain, which can hinder economic diversification and export sophistication, which require skilled human capital for knowledge-intensive activities.

Figure 7: Unemployment rate (percent), 2010–2022



Source: National Statistics Bureau.

Figure 8: Monthly migration, Paro International Airport, Jan 2015 – Mar 2023



Source: Kuensel (May 20, 2023).

Macroeconomic vulnerabilities have increased amid the pandemic due to a significant deterioration of the external balance and international reserves. Macro-fiscal sustainability was maintained over the past two decades because of large hydro revenues and external grants. However, increased spending to fund the COVID-19 relief measures for individuals and businesses, coupled with subdued revenue performance, resulted in high fiscal deficits and rapid non-hydro

⁷ The fiscal year runs from June to July.

⁸ Unemployment is significantly higher among youth (28.6 percent), educated workers (11.5 and 11.8 percent for workers with a secondary and tertiary diploma, respectively), in urban areas (10.4 percent compared to 3.4 percent in rural areas), and among females (7.9 percent compared to 4.4 percent for males).

⁹ Migration is assumed for Bhutanese who exited but have not reentered the country. Data is restricted to Paro Airport and does not include other land exits. See <https://kuensel-online.com/migration-of-bhutanese/>



public debt since FY20/21, with limited fiscal space to absorb additional shocks. Vulnerabilities in the financial sector, with high levels of non-performing loans (NPL), have increased fiscal risks, given that about 60 percent of assets of the financial sector are controlled by the public sector.¹⁰ The national investment in cryptocurrency mining operations resulted in a significant decline in international reserves in FY21/22 and a widening of the current account deficit (CAD) due to imports of information technology (IT) equipment and related goods for cryptocurrency mining. While the reserve decline is set to be partially replenished through coupon payments, the reserve level remains low

Bhutan faces high vulnerability to natural hazards and climate change, necessitating a focus on adaptation and resilience. Climate change poses significant risk to Bhutan's development, with potentially significant impacts on the economy and people. The rugged terrain and unique climatic conditions of the Himalayas contribute to challenges such as flash floods, glacial lake outburst floods (GLOFs), landslides, forest fires, and windstorms. Climate models predict rising temperatures, irregular precipitation patterns, and more frequent extreme weather events. These factors pose significant risks to the economy, natural resources, and people. However, Bhutan has opportunities to leverage its leadership on climate change and net-zero carbon status. Building on the CEM, the World Bank will prepare a Country Climate and Development Report (CCDR), which will analyze the country's development and climate change challenges and opportunities in an integrated manner. It will identify trade-offs, such as maintaining carbon negativity while promoting growth and job creation, by promoting, for example, climate financing, supporting a just transition for people, and enhancing institutional capacity.

The current growth model is not sustainable.

Bhutan expects to double its hydropower capacity over the next decade, which is expected to have significant effects on the economy. Estimates using a Computable General Equilibrium (CGE) model ("the business-as-usual (BAU) scenario") indicate that the anticipated doubling of the hydropower generation capacity is expected to result in higher growth. However, in keeping with past experience, this growth will not be accompanied by a diversification of the economy. The economy is expected to shift towards electricity and closely related sectors. The appreciation of the real exchange rate is expected to reduce output in non-hydro tradable sectors, especially tourism-related exports. This suggests that there is scope to strengthen the Government's current approach for managing and distributing hydropower revenues to support the development of non-hydro sectors and address the negative effects of the Dutch Disease.

The availability of hydropower rents provides the Government with an opportunity to actively support non-hydro productivity growth and generate employment. The CEM identifies three key areas that require urgent policy focus for achieving more robust and broad-based growth and creating more and better jobs while bolstering climate resilience: (I) facilitating economic diversification, (II) enhancing agricultural productivity and crop diversification, and (III) reforming the financial sector to support economic diversification.

I. Facilitating economic diversification to expand beyond the hydropower and agriculture sectors.

Economic diversification is crucial to increase resilience and generate more and higher quality jobs within the economy. Greater economic and export diversification is associated with lower growth volatility and higher long-term average growth in smaller economies such as Bhutan.¹¹ Bhutan is especially vulnerable to shocks because of its trade openness, economic concentration, and susceptibility to natural disasters and climate change. By diversifying its economy, Bhutan can reduce its dependence on the hydropower sector and generate more employment opportunities, making the economy and its people more resilient to shocks.

Effective management of hydropower rents is crucial in preventing the adverse effects of Dutch Disease and in supporting economic diversification. The allocation of these resource rents can take various forms: (i) they can be used to boost domestic consumption through public or private spending, such as citizen dividends or subsidies; (ii) they can be saved in financial assets, either domestically or abroad, to smoothen expenditure of natural resources or act as a buffer for future generations, thereby mitigating Dutch Disease-type effects (for instance, through a fiscal stabilization or

¹⁰ The financial sector is dominated by SOEs, which at end-2020 accounted for 60 percent of the assets of the banking system and 51 percent of the assets of the non-banking financial institutions (NBFIs), including the pension fund. This includes assets of financial institutions where the RGoB has 50 percent of shares or more. The assets are weighted with the RGoB's share in the companies.

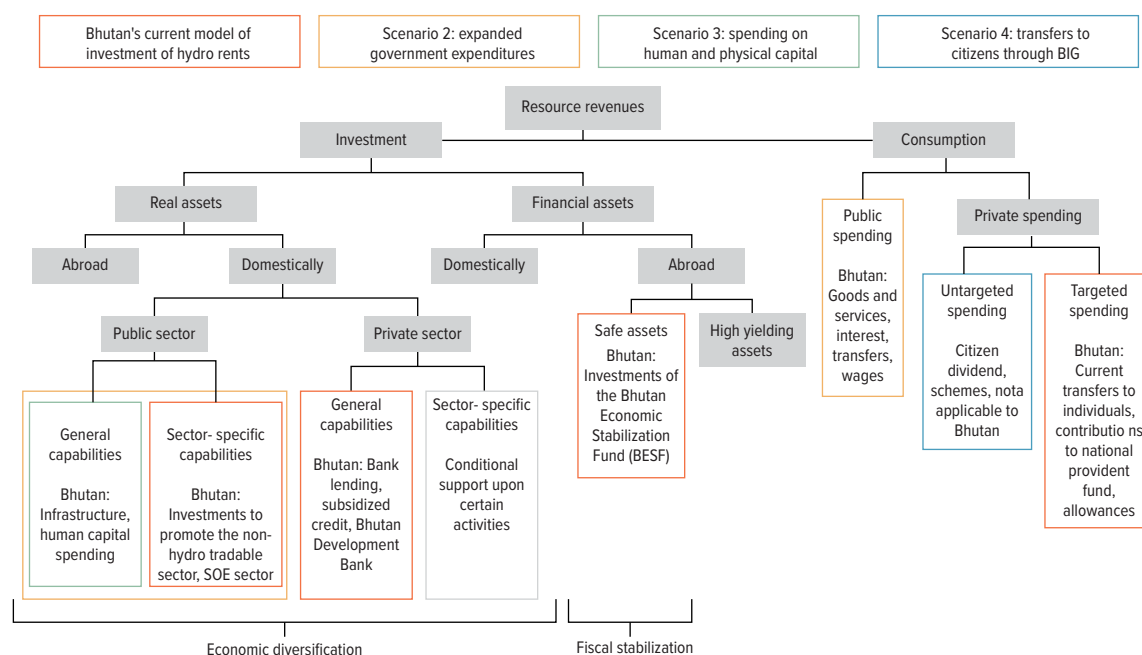
¹¹ World Bank. 2023a. "Global Economic Prospects". January 2023. World Bank, Washington, D.C.

sovereign wealth fund); or (iii) they can be invested in tangible assets to stimulate the public or private sectors by means of subsidized credits, production or export subsidies. The latter can also counter Dutch Disease-type effects by promoting economic diversification into new sectors and industries. This Report highlights economy-wide and sector-specific policies as well as complementary institutional reforms that can lead to greater diversification. International payments for ecological services, high-value tradable services, eco-tourism, high-value IT services are identified as some of the sectors that can contribute to sustainable diversification of the Bhutanese economy.

Bhutan's high resource dependence, low per capita resource rents, and domestic investment shortfall underscore the necessity of utilizing hydropower resources to invest in economic diversification. Natural resource management should consider various factors, such as the extent of resource dependence, per capita resource rent levels, domestic investment rates, and deficits. Notable trade-offs exist, particularly the high opportunity cost associated with excessive investment in stabilization funds at the expense of social spending and domestic productive capacity development. Fiscal savings in stabilization funds, typically held as liquid financial assets abroad, come at a significant opportunity cost, as these funds are not available for domestic investment in productive capabilities that could promote economic diversification. Bhutan's reliance on hydropower is substantial, yet its per capita hydro resource rents are modest at US\$400, in contrast to the higher rents of resource-rich nations like Norway and the UAE. Bhutan also faces considerable investment needs in essential social and infrastructure sectors.

In order to promote diversification, Bhutan could allocate more of its resource rents towards long-term investments. Currently, the majority (54 percent) of domestic revenues, 40 percent of which comes from hydropower, is consumed by public spending on wages, goods and services, rather than financing investments. Private spending accounted for 18 percent and was directed to social transfers, including allowances and contributions to the National Provident Fund. A minimal amount (0.2 percent) is allocated to fiscal stabilization, which is insufficient to cushion the volatility of hydro revenues and public expenditure during downturns. The remaining domestic revenues (28 percent) have been allocated towards investments. With Bhutan's capital spending largely supported by external grants and the anticipated decline in Official Development Assistance following its graduation from the LDC status, it is crucial to reallocate domestic resources, including resource rents, towards capital investments. Such strategic public investment can enhance productivity in non-resource tradable sectors and mitigate the effects of Dutch Disease.

Figure 9: Pathways for managing resource revenues



Source: Adaptation from Chang, H. J., and Lebdioui, A. 2020.¹²

¹² Chang, H. J., and Lebdioui, A. 2020. "From Fiscal Stabilization to Economic Diversification: A Developmental Approach to Managing Resource Revenues". WIDER Working Paper 2020/108. UNU-WIDER. Helsinki, Finland.

Furthermore, to enhance fiscal stabilization, it is necessary to reserve more hydropower resources. As indicated in the Bhutan Public Expenditure Review (PER), Bhutan's government spending is among the most procyclical compared to its peers, largely due to the fluctuating nature of hydropower revenues. Allocating a portion of the resource rent to the Bhutan Economic Stabilization Fund (BESF) could help stabilize these volatile hydro revenues and public expenditures in the face of negative shocks. This would mitigate the need for spending reductions during economic downturns that could exacerbate the growth decline, particularly in areas such as infrastructure and human capital investment.

Channeling additional hydropower revenues to improve physical and human capital can result in higher growth and diversification compared to the business-as-usual (BAU) scenario. Estimates from the CGE model indicate that channeling additional hydropower revenues into physical and human capital leads to labor productivity improvements and enhances capital accumulation.¹³ Under the physical and human capital scenario, the economy becomes more diversified, as shown by a lower economic concentration index compared to the BAU scenario (Table 1). The industrial and construction sectors, which rely heavily on labor, are estimated to benefit the most in terms of value-added. Moreover, all sectors experience higher growth due to the direct impact on factors of production and the indirect effect of increased household spending. As a result, all households benefit from these investments, with higher consumption growth compared to the BAU scenario. On the other hand, distributing additional hydropower revenues directly to households through fiscal transfers, such as through a Basic Income Grant (BIG), is estimated to result in greater economic diversification (reflected by a smaller economic concentration index) but at the cost of slower growth. However, such a fiscal transfer program may be easier to implement but may not guarantee the necessary investments for diversification in case such transfers are channeled to consumption.

Table 1: Economic development in different scenarios, 2030

	2019	Scenario 1: No hydro	Hydro-led scenario 2: BAU	Scenario 3: Physical and human capital	Scenario 4: BIG
GDP	180.9	260.8	280.6	293.3	277.1
Domestic Absorption	205.2	292.8	271.3	292.7	264.1
Savings	69.2	98.2	98.2	107.8	98.2
Hydro production (real)	20.2	23.5	44.7	45.6	45.1
Non-hydro production (real)	257.0	354.6	331.3	350.3	334.4
Economic concentration index	623.0	685.8	725.6	722.2	719.5
Government consumption	32.6	47.7	56.1	50	34.7
Household consumption per-capita (in thousands of Nu)	129.8	184.5	147.3	169.8	165.3

Source: Shutes, Feuerbacher, and McDonald. 2022. CEM Background Paper. Note: All figures in Nu billions unless otherwise indicated. Please note that estimates are indicative and should not be interpreted as actual growth estimates.

Investments in physical and human capital may not be sufficient to ensure economic diversification. Bhutan faces inherent structural challenges such as being landlocked, having a small labor force, and a small domestic market. High fixed costs for establishing and operating businesses, along with labor market rigidities, hinder competitiveness and typically discourage diversification efforts in smaller economies.¹⁴ For instance, the small labor force hampers Bhutan's ability to engage in labor-intensive manufacturing that generally requires a larger workforce, and the small domestic market limits economies of scale. Such economies can significantly benefit from harnessing external (global) demand,

¹³ Compared to the BAU scenario, additional hydropower rents are redirected from general government spending towards investments in human and physical capital. A stylized approach is taken in which additional revenues are split equally between spending on training, resulting in labor productivity improvements, and spending on capital investments via government savings. The CGE scenarios are indicative and aim to demonstrate broad trends and trade-offs.

¹⁴ World Bank. 2023a. "Global Economic Prospects". January 2023. World Bank, Washington, D.C.

given the limited scale of internal (domestic) demand. The non-hydro sector also suffers from the effects of the appreciation in the real exchange rate, which further undermines its competitiveness. Although they are critical, conventional policies such as macro stability, trade openness, investments in physical and human capital, and a favorable business environment can be insufficient to ensure economic diversification. Given the early stage of development of the private sector, sector specific policy interventions will be required to achieve this objective.

Bhutan has implemented sector-specific policies to facilitate economic diversification, but the measures have had limited success in stimulating export diversification and creating new job opportunities. Notable policy measures have included reliance on SOEs in competitive sectors, tax incentives, directed lending, skills development programs, and the establishment of special economic zones (SEZs). However, profitability of SOEs is lower in competitive sectors such as manufacturing, retail, and transport in comparison to non-competitive sectors. Fiscal incentives have primarily favored medium and large businesses in manufacturing, finance, and tourism. Directed lending programs targeting the agriculture and Cottage and Small Industries (CSI) sectors have contributed to high NPLs, while limited credit availability remains a significant constraint to their development.

Sector-specific policies have been implemented in many countries as part of their growth strategies, but there are many examples of failed and ineffective policies. Governance failures, including state capture by rent-seeking interests and short-term electoral considerations, can result in suboptimal outcomes. In order to mitigate these risks, it is crucial to establish strong institutional mechanisms that incentivizes beneficiaries to engage in market competition with clear performance criteria for selective interventions. Policy support could focus on export promotion to leverage international competition and target sectors instead of specific firms for the policy support. Additionally, independent and appropriately qualified experts in the selection of projects that qualify for public support can further enhance the effectiveness of these policies.¹⁵

The hydropower sector could be developed further, given untapped potential and opportunities in the regional electricity market in South Asia. Establishing stronger backward linkages with the hydro sector, for instance through enhancing domestic capabilities for hydropower maintenance and engineering, could lead to greater spillovers to the non-hydro sector. This, in turn, could stimulate demand for goods, services, and labor from various sectors. The forthcoming Bhutan CCDDR will assess the impact of climate change on hydropower assets and electricity generation, the potential to expand hydropower, options for the end-use of the additional generation capacity (domestic consumption or export), and quantify investment needs and financing options, including from the private sector.

Policies that create a conducive environment for the development of the non-hydropower sector will be key to sustain future growth. Over the past two decades, productivity growth in the non-hydropower sector has been relatively weak. Policies that strengthened macroeconomic stability, improve institutions and business environment, facilitate flexible and efficient labor market regulations, reduce barriers to trade, and investments in infrastructure and human capital, remain critical for promoting continued growth in the non-hydro sector.

- **The capacity and performance of SOEs could be improved given their significant role in the economy.** SOEs in the electricity sector have consistently reported profits, but the performance of SOEs in other sectors has been mixed. The 2023 Public Expenditure Review (PER) recommends strengthening SOE oversight and corporate governance by implementing a more centralized ownership model with clear reporting lines and responsibilities.¹⁶ Additionally, it suggests reviewing the current Annual Performance Compacts system and performance-based compensation of Druk Holding and Investments (DHI) and MoF to improve performance management. Promoting the professionalization and diversification of SOE Boards and enhancing SOE investment management are also crucial steps towards improving the overall performance of SOEs.

¹⁵ See, for instance Cherif, R. et al. 2022. "Industrial Policy for Growth and Diversification: A Conceptual Framework". IMF, Washington D.C., and Cherif, R. and Hasanov, F. 2019. "The Return of the Policy That Shall Not Be Named: Principles of Industrial Policy". IMF, Washington D.C. and Cherif, R. et al. 2022. Industrial Policy for Growth and diversification: a conceptual framework. Washington DC: IMF.

¹⁶ The current SOE ownership model current ownership model has multiple actors and is complex. MoF, in addition to holding shares in socially oriented SEs, holds shares directly and indirectly in commercially oriented companies, including companies where DHI holds shares.

- ▶ **The efficiency of public expenditure in health and education could be improved.** Bhutan spends more than its peers on education and health, but there is room for efficiency gains in both sectors. According to the 2023 Bhutan PER, the country ranks 68th out of 131 countries in education expenditure per school-age child, and 86th based on learning adjusted years of schooling. Bhutan is facing a relatively low efficiency level for education spending compared to other middle-income countries. In health, Bhutan's per capita spending in purchasing power parity terms is significantly higher than its regional peers and countries in a similar income group. A stochastic frontier analysis suggests that Bhutan's health expenditure is relatively efficient, but it could still achieve the same health outcomes with 6 to 9 percent less spending if it matched the most efficient countries in the sample.
- ▶ **Upskilling policies, including vocational training and more demand-driven Technical and Vocational Education and Training (TVET) programs could help integrate the youth and low-skilled individuals (particularly women) into the labor market and emerging industries.** Strengthening the linkages between public TVET institutions and the labor market is crucial, as highlighted in the World Bank Labor Market Assessment Report. Reforms in the labor market, including labor regulations that facilitate job switching, a functional Labor Market Information System (LMIS) to identify available skills, and skill-related policies to enhance managerial practices and soft skills, can support workers' mobility and firms' access to labor. Additionally, on-the-job assistance can be provided to self-employed and family workers with low education levels, helping them find wage employment opportunities in different regions. Employment service centers under the Ministry of Industry Commerce and Employment (MoICE) can play a significant role in facilitating these efforts.
- ▶ **Strengthening the Public Investment Management (PIM) system can help expand high quality infrastructure services and crowd in private investments.** The contribution of physical capital to non-hydro sector growth has declined over the recent decade. Bhutan has one of the highest levels of public capital spending as a percent of GDP (excluding hydro investments) in the world, but there are significant investment deficits, including in infrastructure. The quality of infrastructure remains below many comparator countries.¹⁷ A recent diagnostic assessment of the PIM system highlighted that Bhutan has not yet established a fully operational PIM system that aligns with international standards.¹⁸

Sector-specific policies could support diversification, provided they are targeted, transparent and minimize budgetary costs. Given the critical role of human capital in economic diversification, and to avoid further brain drain, several initiatives could be implemented in the short term as outlined below.

- ▶ **Bhutan could create strategic partnerships with universities to establish tailored executive programs to meet specific needs in the Bhutanese context.** Strategic partnerships with universities can provide the Government with more leverage over the training content, aligning it with the national objectives and reducing the dependence on foreign technical assistance. Such programs have been critical for the development of competitive sectors across the globe, for instance, the fruit sector in Chile through the Chile and University of California Program.¹⁹
- ▶ **The skills of non-resident Bhutanese could be leveraged for the transfer of learning, technology, and social capital back to Bhutan.** The Government could liaise with non-resident Bhutanese to explore channels through which they can contribute to the emergence of new activities. For example, Malaysia established TalentCorp in 2011 to attract talent back from abroad and bring in foreign talent to address the shortage of technical skills in science and ICT (Mukherjee et al., 2011).
- ▶ **The existing incubation and acceleration centers could be strengthened to promote entrepreneurship and innovation.** These centers have the mandate to drive economic growth and create job opportunities for educated workers. However, they currently face funding uncertainties. Improving the quality of their services,

17 WB. 2023b. "Bhutan Public Expenditure Review." WB, Washington, DC.

18 RGoB. Ministry of Finance. 2021. Strategic Diagnostic Assessment of the Public Investment Management System in Bhutan.

19 In Chile, to remedy the absence of adequate human capital, which was for a long time the obstacle for the development of the fruit sector, an exchange program was established in 1965 with the University of California, which sent more than 80 Chilean graduate students to study agricultural economics in California to learn how to cultivate and export fresh fruits in Chile. This appears to have been an extremely successful and impactful grant considering the growth of the sector during the following decades (Bravo-Ortega and Eterovic, 2015).

including access to financing, market validation, business plan development, research and development support, mentorship, and connections to supply chains and markets are critical for effective promotion of entrepreneurship and innovation.

The Government could strengthen the institutions for designing and implementing sector-specific policies.

- ▶ **A new fiscal strategy outlining a long-term vision could introduce a minimum share of reinvestment of hydropower rents to support economic diversification away from the overreliance on the hydropower sector.** In parallel, the Bhutan Economic Stabilization Fund (BESF) and the fiscal stabilization measures that regulate contributions to and uses of the BESF could be operationalized to smooth volatile hydro revenues and public spending. One option could be to apply the Hartwick rule, which suggests that the value of (net) investment needs equal the value of rents on extracted resources at each point in time.²⁰
- ▶ **Given the importance of effectively allocating resources, concentrating resources on a select few development finance institutions and initiatives can be beneficial.** Public development finance institutions can bring in private and foreign investments, but they require adequate managerial and regulatory capacity. Bhutan has various institutions such as the Bhutan Development Bank (BDB), DHI, the Bank of Bhutan (BoB), and the BESF. The government could consolidate the total number of these institutions, while broadening the scope of select entities to invest hydropower rents in productivity-enhancing assets. One option to channel hydropower revenues into domestic investments for export diversification is to broaden the mandate of DHI from a holding company to a development fund, in line with the experience of Khazanah in Malaysia. Alternative options include an expansion of the mandate of the Bank of Bhutan (BoB) to include development banking, increasing the capacity of the BDB, which is currently engaged in providing loans to Small and Medium Enterprises (SMEs) in the agriculture sector, and reorienting BESF into a development fund.
- ▶ **Irrespective of the institutional setup, improving the ability to appraise, monitor, and evaluate investments is essential for the success of utilizing hydropower revenues for productive diversification.** The establishment of an autonomous and technically equipped public Investment Evaluation Unit (IEU) is key to supporting the development of strong analytical capacity to evaluate development projects and policies. The existence of a strong IEU could send a market signal to potential investors regarding the quality of economic management. The IEU could evaluate the existing sector-specific policies to determine whether they are sufficiently targeted, transparent and minimize budgetary costs (and risks). When considering new policies and projects, emphasis could be placed on identifying those with the greatest potential returns and manageable financial, environmental and social risks.

II. Enhancing agricultural productivity and crop diversification to “push” workers out of agriculture

Bhutan’s agricultural sector has undergone a significant transformation in recent decades. This shift, occurring across three dimensions (macro, spatial, sectoral), is driving the specialization of the agriculture sector.

- a. On a **macro** level, the contribution of agricultural to total output has started to decline but the decline in agricultural employment has been much smaller. The movement of labor from agriculture to other sectors has been slow. Between 2005 and 2017, the share of agricultural labor only decreased by 1 percentage point.
- b. However, there are variations in the pace of structural transformation across different geographic areas. At a **spatial level**, Bhutan has witnessed a reallocation of workers from more to less agricultural areas, which has increased agricultural labor shares in labor shedding areas. Areas close to India, urban centers, and regions connected to urban centers and the Indian market through road infrastructure have experienced faster structural transformation. This has led to a significant decline of the share of agricultural labor. Conversely, rural and mountainous areas,

²⁰ The Hartwick Rule suggests that countries should invest resource rents into other types of assets, and that a constant level of consumption can be sustained if the value of investment equals the value of rents on extracted resources at each point in time (Hartwick, 1977). Malaysia is one of the few countries that has followed the Hartwick rule. Other countries that have established mechanisms similar to the Hartwick rule, aiming to invest resource rents into long-term assets include Norway (Pension Fund), or Botswana (Pula Fund). See Hartwick, J.M. 1977. “Intergenerational Equity and the Investing of Rents from Exhaustible Resources.” *American Economic Review*, 66, 972-74.

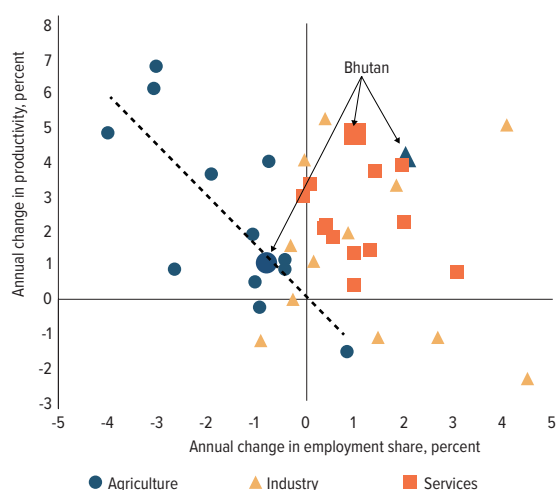
particularly in the Northwest of the country, have witnessed an increase in agricultural labor share. This spatial polarization has resulted in economic activity being concentrated in urban and connected centers, while rural areas remained focused on agriculture.

- c. **Within the agricultural sector**, there has been a significant shift with a decrease in the production of traditional crops like maize and paddy rice and increase in the growth of higher value-added products such as spices and fruits. This shift has reoriented agriculture towards its export-oriented comparative advantage. Overall productivity has remained stagnant but there are significant spatial heterogeneities.

Productivity growth of the agriculture sector has been significantly lower than in peer countries (Figure 11). The process of specialization is still at an early stage, with agricultural productivity gaps remaining large and stemming primarily from inadequate access to irrigation, crop damages, labor shortages, difficult transport and export logistics, and challenging topography. Lack of adequate irrigation facilities leads to substantial reduction in yields for paddy rice and maize. Estimates show that addressing issues related to irrigation could raise average yields for these crops by about 6 percent each, and for cardamom by 11 percent. Protecting crops from damages could raise maize and paddy yields by 15 and 9 percent, respectively. Removing the impact of labor shortages – for instance through the adoption of labor-saving technology – could increase paddy, cardamom and areca nut yields significantly.

Closing agricultural productivity gaps would accelerate structural transformation. In the past, areas that have experienced larger yield growth have also experienced declining agricultural labor shares, which suggests that yield increases drive spatial specialization (Figure 12, Figure 13). This is consistent with the literature that highlights the importance of labor-saving technologies in agriculture to free excess labor for non-agricultural enterprises (Figure 10). Estimates from a spatially disaggregated CGE model calibrated to Bhutan corroborates this assessment. Simulations involving a 20 percent reduction in existing yield gaps through policies to improve the quality of agricultural capital (better machines) and expand access to fertilizers and pesticides (more effective chemicals) and fuel (better quality fuels) would result in agricultural wages increasing by less than low-skilled and unskilled wages, prompting households to seek employment outside agriculture. This would reduce the supply of agricultural labor and increase the supply of unskilled and low-skilled labor, which benefits both the service sector and households that switch sectors.

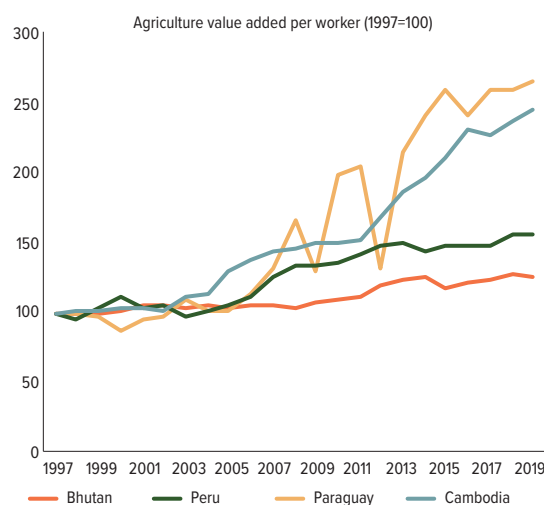
Figure 10: Agricultural productivity growth is key to facilitate a movement of labor into non-primary sectors...



Source: World Development Indicators.

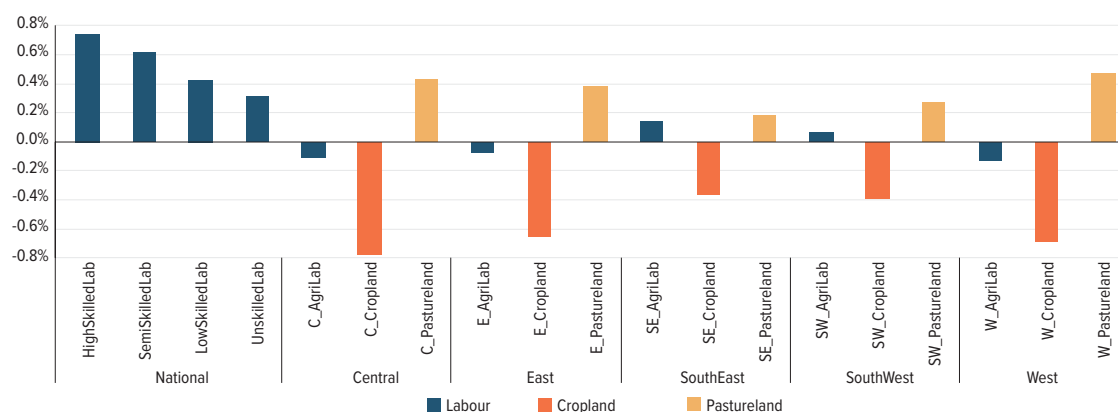
Note: The left-hand side figure presents average annual changes (in percentage points) for the period from 2000 to 2017 using the World Bank Group's Job Structure Tool.

Figure 11: ...Productivity growth in agriculture was significantly lower than for peer countries.



Source: World Development Indicators.

Figure 12: Closing yield gaps by augmenting non-labor production inputs raises relative wages of non-agricultural workers...



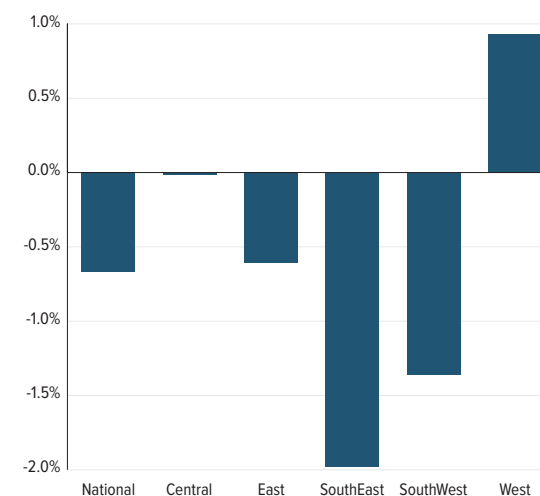
Source: World Development Indicators.

Water supply is a critical constraint to agricultural productivity and is likely to be exacerbated by climate change. Currently, inadequate water supply reduces crop yields by 4 to 11 percent. While climate change may temporarily increase rainfed yields for traditional crops like maize, it will also lead to increased rainfall variability in the medium term, highlighting the need for irrigation infrastructure. However, climate change also presents an opportunity to specialize in higher value-added crops such as vegetables, fruits, and spices, as favorable climatic conditions will support their production and create export opportunities. To realize this potential in full, it is crucial to consider the medium-term impacts of climate change and invest in irrigation infrastructure accordingly. Failure to do so may delay necessary investments and hamper the agricultural sector's ability to specialize in higher value-added products and capitalize on export opportunities.

The analysis leads to three principles that can guide agricultural policy:

- d. As structural transformation progresses, agricultural labor shortages will increase as people move towards urban and connected centers. The goal of growth policy is to facilitate this movement while enabling investments in technologies that compensate for the labor loss.
- e. Avoiding investments into traditional rainfed crops with limited growth prospects is key to supporting the transition towards Bhutan's comparative advantages and to enable the country to benefit from crops that are likely to experience increasing yields with climate change in the longer run.
- f. Investing and enabling private investment into irrigation is critical to increase yields, adapt to climate change and enhance structural transformation.

Figure 13: ...which induces a shift of labor out of agriculture and accelerates structural transformation, especially in the southern part.



Source: World Development Indicators.



Policy interventions could focus on promoting private investments, access to technology and production inputs, and targeted assistance to farmers.

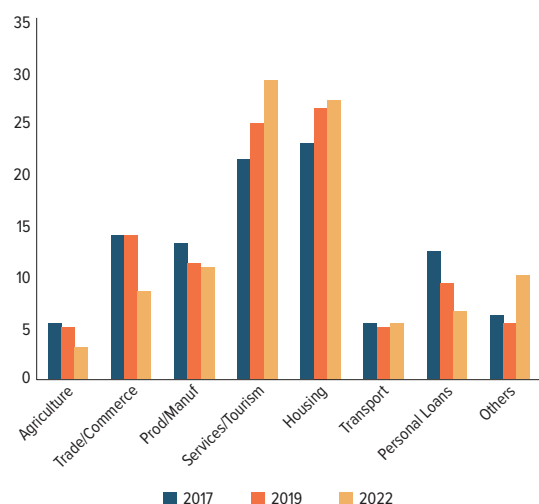
- ▶ **Attracting additional Foreign Direct Investment (FDI) to agriculture can help boost productivity growth.** Foreign Direct Investment provides the capital needed for investments and facilitates technology transfers that can help agricultural producers make better use of their resources and land. Bhutan has made significant progress in the liberalization of its FDI regime, but investment in the agriculture sector is still subject to minimum project cost and a cap on foreign ownership, which precludes investment into smaller scale and niche farming operations with potential for high growth. To attract more FDI, Bhutan could consider eliminating the foreign ownership cap and reducing the minimum investment threshold. It could also consider providing free visas to prospective investors.
- ▶ **Marketing Bhutan's unique global brand can help attract foreign investment and promote agricultural exports.** Branding Bhutanese agricultural products with the country's focus on environmental conservation and sustainable development can stimulate global demand and help attract investments. A dedicated investment promotion agency can participate in international trade fairs, initiate marketing campaigns, and identify and approach prospective investors.
- ▶ **Providing farmers with guidance and financial incentives to adopt sustainable land management practices is crucial for increasing productivity and ensuring climate-resilient agricultural production.** While temporary short-term yield changes induced by climate change may encourage farmers to invest in traditional crops with limited long-term profitability, it is important to promote the adoption of higher value-added crops such as vegetables, fruits, and spices. These crops can benefit from favorable climatic conditions and create export opportunities. However, transitioning to sustainable and climate-resilient practices may require upfront costs and changes in production methods. To support farmers in overcoming this timing inconsistency, targeted support measures such as guarantees for loans, matching grants, or direct, well-targeted subsidies can be implemented.

III. Financial sector reforms to support economic diversification and finance private non-hydro investments

State Owned Financial Institutions (SOFIs) dominate the financial sector in Bhutan and the banking system is highly concentrated. In 2020, SOFIs accounted for 60 percent of the banking system's assets and 51 percent of the assets of Non-Banking Financial Institutions (NBFIs), including the National Pension and Provident Fund (NPPF). The BoB, which is mostly government-owned, is the largest bank in terms of asset size and deposits. It holds 44 and 48 percent of the banking sector's assets and deposits.

The allocation of credit in the economy remains skewed, with the majority directed towards 'non-enterprises'. Prior to the pandemic, the financial sector expanded to provide the necessary credit and financing for hydropower projects. Even though there was a rapid increase in credit for the non-hydro sectors, it was not broad-based. The tourism and housing sectors accounted for nearly 50 percent of the total credit in 2022. Conversely, the share of trade and manufacturing sectors declined in recent years (Figure 14). Cottage firms, defined as firms that employ less than five workers, account for more than 95 percent of firms but receive less than 10 percent of the total credit in the economy. The credit share of small and medium firms declined significantly in recent years, while the share of non-enterprises, including housing, transport, personal, employee loans, and education loans, increased to nearly 60 percent of total credit in 2023 (Figure 15). This is in line with the lack of economic diversification and the absence of a thriving private sector. Limited access to finance is cited as one of the top constraints for small and medium-sized companies.

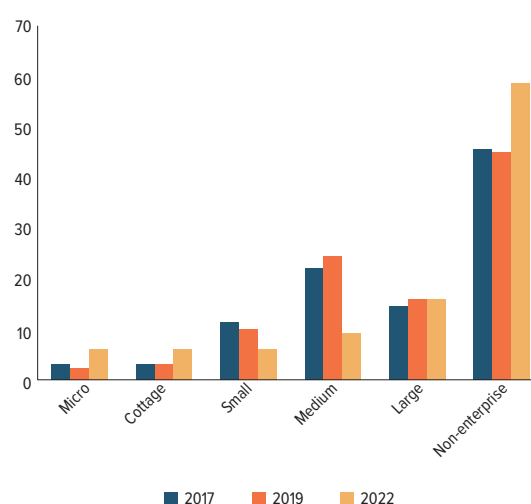
Figure 14: Sectoral composition of credit
(percent of total), 2017, 2019, and 2022



Source: Royal Monetary Authority (RMA).

Note: Sectoral shares in figures add up to 100. "Others" include education loans. Non-enterprises include housing, transport, personal, staff, and education loans.

Figure 15: Credit composition by firm size
(percent of total), 2017, 2019, and 2022

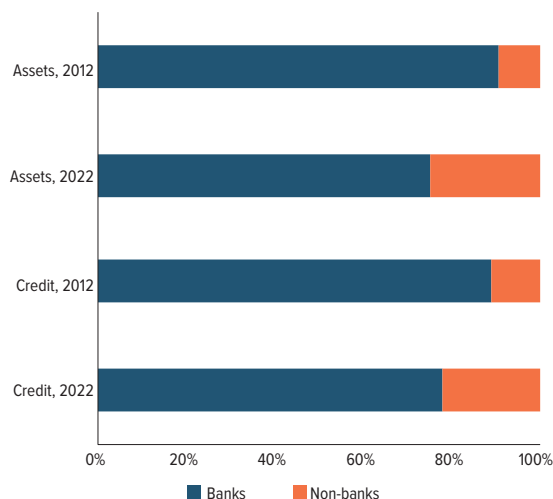


Banks mostly provide traditional lending products and have not adopted risk-based pricing. The range of financial instruments offered by commercial banks has expanded but is still dominated by traditional banking products. Banks typically offer basic credit products with fixed interest rates and terms.²¹ Loan requests are primarily evaluated based on collateral rather than the borrower's financial viability. Risk-based pricing, which links the borrower's credit score to the loan's interest rate, is not commonly used by financial institutions. The bank's strong preference for collateral over longer-term cashflow projections has resulted in borrowers seeking alternative sources of financing from non-bank lenders.

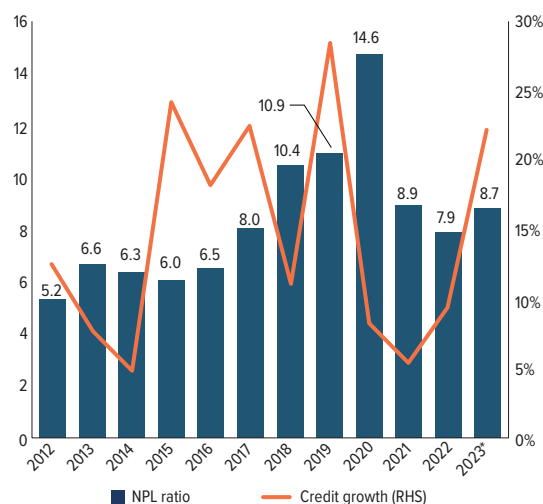
Capital markets remain shallow, with limited liquidity and trading activity. One contributing factor is the small number of listed companies compared to other regional markets. The limited development of the capital market can be attributed to various factors, including issuer and investor-related issues, and the absence of regulations and capabilities for underwriting in the market. Due to the lack of deep capital markets and investment opportunities, insurance and pension funds are engaging in credit business with individuals and firms and competing with banks. As a result, the share of the non-bank sectors in total financial sector assets has increased between 2012 and 2022 (Figure 16). However, non-banks are more susceptible to maturity mismatches and are subject to weaker supervision and possess lower capacity to absorb losses.

Asset quality has deteriorated following the pandemic, especially in the non-banking sector. The significant credit expansion from 2014 to 2019, without robust credit appraisal practices, has worsened asset quality. Credit growth sharply declined during the pandemic before recovering in recent years (Figure 17). Non-banks, in particular Royal Insurance Corporation of Bhutan (RICB) and Bhutan Insurance Limited (BIL), reported higher NPLs compared to commercial banks. Lax credit management, monitoring, and recovery practices contributed to NPLs. By June 2020, the ratio of NPLs to total loans increased to nearly 15 percent as micro, small, and medium enterprises (MSMEs) struggled to meet debt repayments. In December 2021, NPLs had declined to 9 percent, primarily due to the moratorium on loan repayments and other measures introduced by the Royal Monetary Authority (RMA). The NPL ratio declined further in 2022, largely due to the lack of recognition of potentially stressed assets. The majority of NPLs are concentrated in the services and tourism sectors (33 percent), followed by trade, production and manufacturing, and housing sectors.

21 Since 2016, they have also started to offer some credit products with floating interest rate.

Figure 16: Share of banks and non-banks in credit and assets (percent), 2012 and 2022

Source: Royal Monetary Authority..

Figure 17: Gross NPL and credit growth (percent), 2012-2023

Source: Royal Monetary Authority, World Bank annual reports.

Measures to tackle rising NPLs in the aftermath of the pandemic need to be strengthened. In 2022, the RMA adopted a Prompt Corrective Action (PCA) Framework to facilitate early supervisory intervention and mitigate risks that could jeopardize the stability of financial service providers. It is crucial that financial institutions implement the NPL resolution framework, ensuring that only viable accounts are restructured, and establish a robust early warning, monitoring, and recovery system. Strengthening credit information systems and enhancing governance of financial institutions can prevent the emergence of new NPLs. Specific steps are highlighted below.

► **Ensuring the implementation of the guidelines for credit underwriting will reduce risks during loan origination.**

While the Risk Management Guidelines 2019 provide an overview of the procedures for assessment, review, approval, disbursement, and administration of credit, the rise in NPLs in recent years indicates uneven compliance with these guidelines. All lenders have comprehensive credit manuals that cover essential areas of credit underwriting and monitoring. However, further examination is needed to evaluate the implementation of these internal manuals.

► **Financial institutions could develop internal procedures and reporting mechanisms to identify and manage potential non-performing customers at an early stage.** They could monitor credit risk using Early Warning Indicators (EWIs) and Key Risk Indicators (KRIs) at loan origination and throughout the loan's lifespan. Conducting sensitivity analysis and stress testing can mitigate the likelihood of adverse impacts in the future. The RMA could issue a guideline outlining the fundamental principles for establishing an early warning system and incentivize financial institutions to assess and address any gaps based on these guidelines.

► **The loan pricing mechanism could be modified to reflect borrower risks.** The absence of risk-based pricing highlights the need for a framework that aligns loan pricing with risk appetite, business strategies, profitability, and risk perspective. Financial institutions could define pricing approaches based on the type and credit quality of borrowers, allowing for different loan prices to be offered based on these attributes.

► **The Government could further develop the bankruptcy and insolvency framework to facilitate prompt resolution of NPLs.** The Bankruptcy Act could be reviewed and amended to establish a comprehensive framework that enables businesses to effectively address insolvency and reinforce the rights of secured creditors. So far, there has never been a filing for protection under the Bankruptcy Act. Instead, financial institutions are opting for out-of-court settlement for faster settlement of insolvency cases under the provisions of the NPL resolution framework.

Expanding the coverage of service providers and data systems in the Credit Information Bureau (CIB) can reduce collateral-based lending. Currently, only financial institutions, some microfinance institutions, and utility companies report to the CIB. As a result, the utilization of credit information by lenders is limited. To provide a comprehensive credit history and a new credit scoring system, it is critical to expand the coverage of information by including a wider range of financial service providers in the CIB.

Ensuring a level playing field between state-owned commercial banks and other banks can address risks to financial stability. State-owned commercial banks hold a majority of deposits in the economy. For example, the BoB benefits from a significant advantage in cost of funds compared to other banks, due to its large public sector demand deposit, resulting in a substantial increase in the BoB's market share. Promoting competition among banks by establishing a level playing field will help distribute risks more evenly across the financial system.

Developing the domestic capital market and facilitating access to external capital is a priority. This can be achieved by extending the range and maturity of marketable government securities, which would deepen the securities market. This would improve monetary policy implementation, create a yield curve for a corporate bond market, and support better loan pricing and long-term investment opportunities for the non-banking sector. The role of domestic and foreign private sector capital is limited. Bhutan has one of the most restricted capital accounts in the world, with long-standing capital controls in all categories of transactions. While the FDI framework has been gradually liberalized, it still includes relatively high minimum thresholds, local participation rules, and sectoral restrictions. As a result, the number of approved FDI projects and their aggregate size has been declining. The Government has recently eased access to External Commercial Borrowings (ECBs) for the real sector (i.e., non-equity capital flows) to improve access to international finance for domestic firms but continues to limit ECB for the banking sector. Medium-term reforms could include opening the banking sector to ECB under strict regulatory oversight, raising the debt-equity ratio for ECB beyond the current 3:1 limit to support projects with higher leverage, potentially with sector-specific variations, and allowing shorter-term ECBs for borrowers with a natural hedge in foreign exchange earnings.

To promote private finance and develop green financial instruments, the Government can develop a detailed plan based on its Green Finance Roadmap. Bhutan is highly vulnerable to climate change impacts and faces various natural hazards. Investment at scale is required to meet climate-related goals, as public funding alone is insufficient. The Government has adopted the Green Finance Roadmap and the Green Taxonomy to increase lending and investment in climate objectives. The Government has also introduced reporting requirements and environmental standards. Blended finance tools such as risk-sharing instruments, guarantees, and funds leveraging philanthropic capital can be used to combine public and concessional finance with private capital. Blended finance, tailored to the local context, can mitigate risks associated with new technologies or pioneering projects by shifting the investment risk-return profile through flexible capital and favorable terms. Enhancing market transparency and embedding the national green taxonomy in regulatory frameworks can further strengthen climate finance in Bhutan.

Digital technologies are critical for promoting financial inclusion, especially in Bhutan where cash still dominates the payment system. Citizens face challenges in accessing finance, with limited access to credit due to banks' reliance on collateral rather than financial viability. Many rural communities lack access to formal remittance services and digital payment systems, due to low presence of bank branches and ATMs. To promote financial inclusion, digital technologies are crucial, enabling faster and affordable payments, promoting collateral-free lending, and introducing innovative capital market and insurance products for retail customers. Investment in digital technologies, including blockchain, can drive innovation, manage risks, reduce fraud, and facilitate secure transactions. The emergence of digitized assets and technologies has the potential to transform the financial services industry.



Summary of policy options

The report suggests three areas of policy focus to diversify Bhutan's economy and add resilience to growth going forward:

- i. Bhutan will continue to harness its hydropower resources. However, economic diversification will benefit from allocating a much larger share of hydropower revenue towards domestic investment in tangible assets including infrastructure and industries. This can be achieved by improving the intermediation of hydro resources through the appropriate choice of institutional arrangements. Chapter 1 provides a detailed analysis of this issue and highlights institutional choices that can help achieve this objective by directing a significant share of hydro revenue for investments rather than consumption.
- ii. Raising agricultural productivity by diversifying into high-value crops as per Bhutan's comparative advantages can support the broader process of diversification by releasing labor for non-agrarian sectors and boosting agricultural exports. Greater investments into irrigation to increase yields and removing existing barriers to FDI can contribute to this.
- iii. Modernizing the financial sector by strengthening risk management practices, creating a level playing field between public and private players, and ensuring greater contribution from private finance will be critical to support the process of economic diversification.

Table 2 presents a detailed summary of policy actions for sustained and inclusive growth. This table distinguishes between policies which aim to create a favorable environment for the non-hydropower sector, and policies which support specific sectors. Additionally, there are options to strengthen the institutional framework for implementing sector-specific policies. The recommendations for the agriculture sector (Chapter 2) and the financial sector (Chapter 3) can be implemented in the short- and medium-term to achieve the objective. Table 1 also includes information on the timeline, complexity, and probable development returns associated with each policy option.

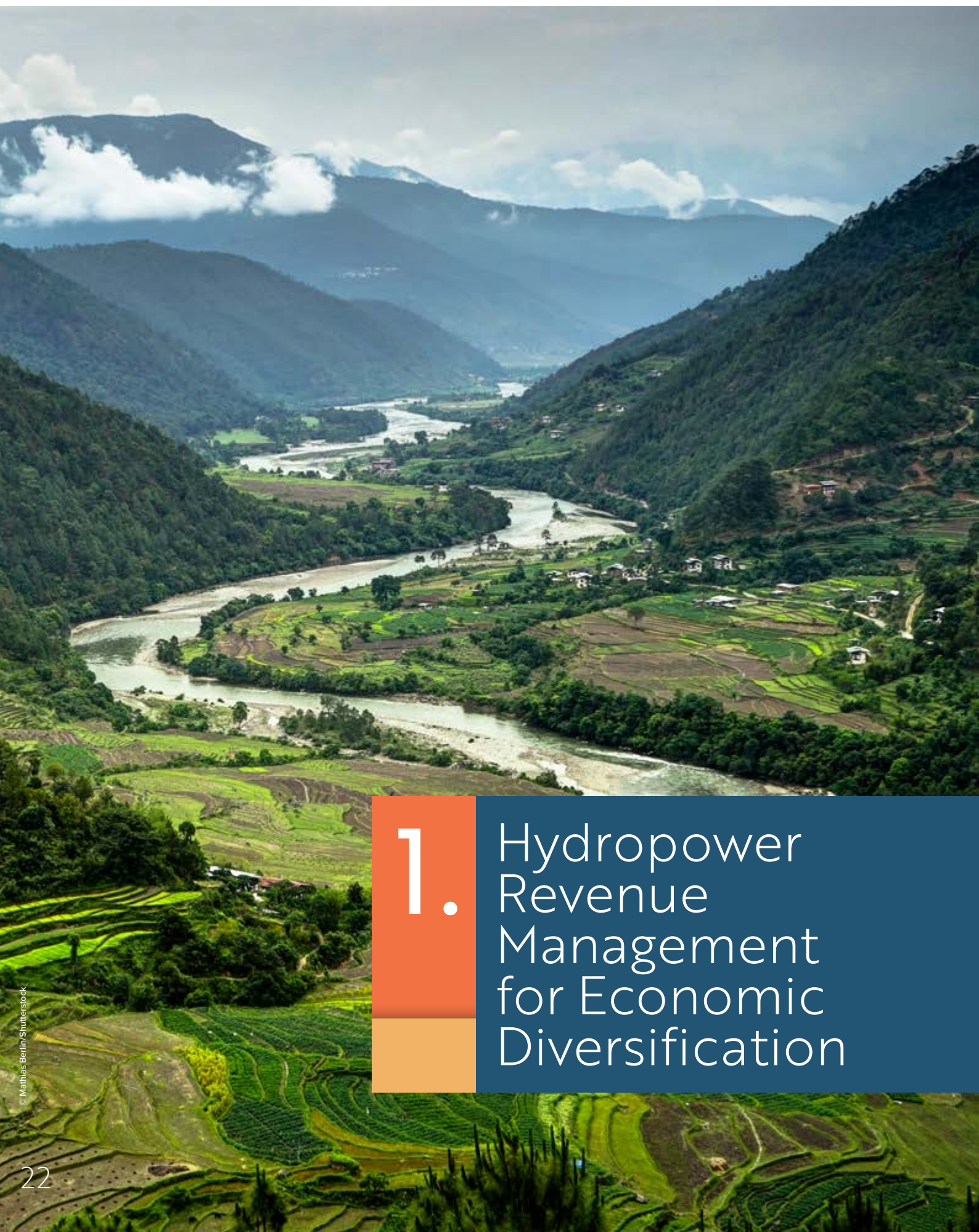
Sector-specific policies are further arranged in three categories – foothills, mountains, and peaks – each with varying levels of rewards and risks. Foothills offer attainable rewards with low risks, such as strategic branding initiatives like “Made in Bhutan” or export promotion agencies. Mountains, while still feasible, require more financial commitment and carry higher risks, such as government intervention in the agriculture and CSI sectors. Peaks have the potential for transformative growth but come with significant risks, such as the Government's strategic investments in cryptocurrency mining and the Gelephu Mindfulness City. These projects require substantial financial investments and careful consideration of environmental, technical, and financial risks. The policies outlined here are illustrative and based on existing initiatives, such as hydropower and directed lending.

Table 2: Policy objectives and priority reform options

Policies	Timeline	Degree of complexity	Development returns
Policies to promote a conducive environment for the development of the non-hydropower sector			
Strengthen the PIM system to expand high quality infrastructure services and crowd in private investments	ST	Low	High
Improve efficiency of health and education expenditure to improve human capital	MT	Medium	High
Strengthen oversight and performance of the SOE sector	ST-MT	High	Medium
Support workers' mobility and firms' access to labor, including through a functional LMIS and strengthened linkages between public TVET institutions and the labor market	ST	Medium	High
Policies to enhance agricultural productivity (Chapter 2)			
Enhance irrigation infrastructure and eliminate regulatory obstacles to cultivate export-oriented crops on paddy land and irrigate non-paddy crops to boost productivity, enable climate change adaptation, and drive structural transformation in agriculture	ST	Medium	High
Promote a fair and competitive environment in the agricultural input industries by leveling the playing field between SOEs and the private sector	MT	High	Medium
Policies to enhance financial sector stability and financial intermediation (Chapter 3)			
Prevent the emergence of new NPLs by strengthening credit appraisal and pricing mechanisms and enhancing governance of financial institutions	ST	Medium	Medium
Ensure a level playing field between SOFIs and other banks to support financial sector stability and	MT	High	Medium
Promote access to finance and financial inclusion by strengthening the CIB, implementing a robust collateral valuation system, and adopting digital technologies	ST	Medium	Medium
Promote private finance and develop green financial instruments	ST	Medium	High
Policies to support specific sectors: Peaks  Mountains  Foothills 			
Create strategic partnerships with universities to establish tailored executive programs for the development of competitive sectors	ST		Medium
Leverage Bhutanese living abroad for the transfer of learning, technology, and social capital back to Bhutan	ST		Medium
Strengthen incubation and acceleration centers to promote entrepreneurship and innovation	ST		Medium
Hydropower (Chapter 1): Leverage additional hydropower resource rents			
Develop the hydropower sector further, subject to economic, environmental, and social impact analysis	ST-MT		High
Establish stronger backward linkages with the hydro sector to increase spillovers to the non-hydro sector (i.e., hydro maintenance and engineering)	MT		Medium



Policies	Timeline	Degree of complexity	Development returns
Agriculture: Specialize in higher value-added products and capitalize on export opportunities (Chapter 2)			
Attract additional FDI, including for smaller-scale and niche farming operations with potential for high growth	ST		Medium
Initiate a proactive investment and export promotion campaign, and leverage Bhutan's brand to boost agricultural exports	ST		Medium
Provide (digital) extension services and financial incentives to farmers to adopt sustainable land management practices to increase productivity and ensuring climate-resilient agricultural production	ST		Medium
Review directed and direct lending to enhance its effectiveness (Chapter 3)			
Review the design of the PSL and NCGS schemes to effectively alleviate credit constraints in risky sectors, such as CSI or MSMEs	ST		Medium
Institutional framework to frame and implement sector-specific policies			
Develop a fiscal strategy with a long-term vision and a minimum share of re-investment of hydro rents for productive capacity building in tradable sectors	MT	Medium	Medium
Consolidate development finance institutions to avoid the spreading of available resources too thinly	MT	Medium	Medium
Improve the ability to appraise, monitor, and evaluate investments, for instance through the establishment of an autonomous and technically equipped public Investment Evaluation Unit (IEU)	ST	High	High
Evaluate existing sector-specific policies to determine whether they are sufficiently targeted, transparent and minimize budgetary costs (and risks)	ST	Medium	Medium



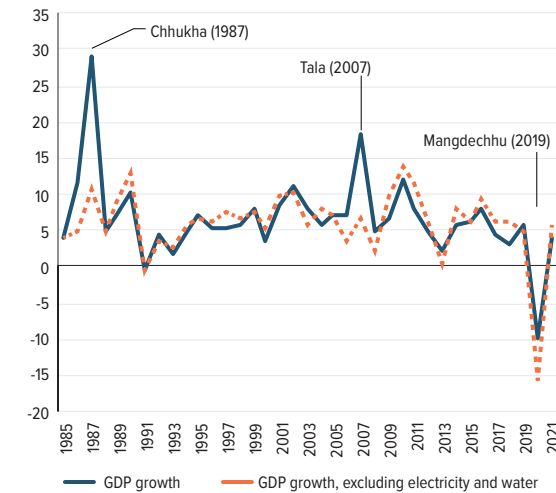
1.

Hydropower Revenue Management for Economic Diversification

1.1. Introduction

Bhutan's growth is heavily dependent on hydropower generation and exports. Real GDP growth averaged 7 percent from 1980 to 2020, but episodes of high growth largely coincided with the operationalization of hydropower projects (Figure 18). The economy contracted in 2019, despite the commissioning of the Mangdechhu plant, due to the impact of the COVID-19 pandemic. Since the first large hydropower project came into operation in 1987 (Chhukha), Bhutan has increased the country's installed hydropower capacity seven-fold, from 336 MW to 2,326 MW, with Tala (2007) and Mangdechhu (2019) being the largest projects (Figure 19). Moreover, there are several plants under construction and the Puna I and II projects, on completion, will more than double the current installed capacity.²² The hydropower projects are mostly financed through commercially priced loans and capital grants from the GoI, with the surplus electricity exported to India.²³ Bhutan is also planning to add substantial capacity through the 1125 MW Dorjilung project. According to the Power System Master Plan 2040, Bhutan to date has an installed hydroelectric power capacity of about one-tenth of its technically feasible potential. However, hydropower already accounts for more than one-third of the country's goods exports and domestic revenues and constitutes 26 percent of its GDP.

Figure 18: Impact of hydropower on GDP in Bhutan (percent), 1985–2021



Source: National Statistics Bureau (NSB)

Bhutan's fiscal accounts and debt dynamics are intrinsically tied to its hydropower sector. From FY10/11 to FY21/22, the country's revenue as a percentage of GDP maintained an average of around 30 percent, bolstered by income from hydropower and substantial external grants, with India contributing two-thirds of these grants. Public expenditure during this period averaged 34 percent of GDP, with the fiscal deficit averaging a modest 0.3 percent of GDP. Capital spending was a major component of government expenditure, accounting for nearly half of it over the past decade, supported by external grants. Bhutan's spending patterns are more procyclical than those of comparable economies. Hydropower revenue is volatile, with annual profits and dividends from SOEs fluctuating based on the commissioning of new hydropower plants and weather conditions.²⁴ Public and publicly guaranteed increased significantly from 69.1 percent of GDP in FY10/11 to 133.3 percent in FY21/22, largely due to external loans for hydropower development. Despite this substantial increase in external debt, the risk of debt distress is expected to remain moderate, as the majority of this debt is linked to hydropower project loans from India, which are expected to be repaid with future hydro revenues and carry low refinancing and exchange rate risks.²⁵

Hydropower exports have generated large foreign currency inflows, raising concerns about the Dutch Disease. Additionally, there have been significant inflows related to hydro investments since the 1980s, primarily through grants and loans during the construction phase, with most of the investments funded by inflows from India (Figure 20). If the increased foreign exchange is used solely for imports, it would not directly affect the money supply or demand for domestic goods. However, if the foreign currency is converted into local currency and spent on nontraded goods within the country, it can increase the money supply and lead to higher domestic prices under a fixed exchange rate regime.

²² Four hydropower projects—Nikachhu (118 MW, expected in 2024), Punatsangchhu 2 (1,020 MW, expected in 2024), Punatsangchhu 1 (1,200 MW, expected in 2027) and Kholongchhu (600 MW, expected in 2029)—will significantly expand the installed generation capacity between 2023 and 2031, from 2,334 MW to 5,273 MW. The Government also commenced work on eight smaller hydro plants in 2022, which will come onstream between 2025 and 2028 (with total capacity of 1501.69 GWh). The smaller hydro plants are financed by Druk Green Power Corporation, the hydropower SOE.

²³ The hydropower projects are implemented under a special inter-governmental agreement between Bhutan and India, in which the GoI covers both financial and construction related risks and commits to buying all surplus electricity at a price reflecting cost plus a net return.

²⁴ While Bhutan's Public Finance Act stipulates that the cost of current expenditure must be met from domestic resources, this rule does not constrain the growth of current spending when there is a temporary increase in domestic revenues.

²⁵ WB. 2023b. "Bhutan Public Expenditure Review." WB, Washington, DC.

Figure 19: Installed capacity, hydropower (MW), 1987-2029

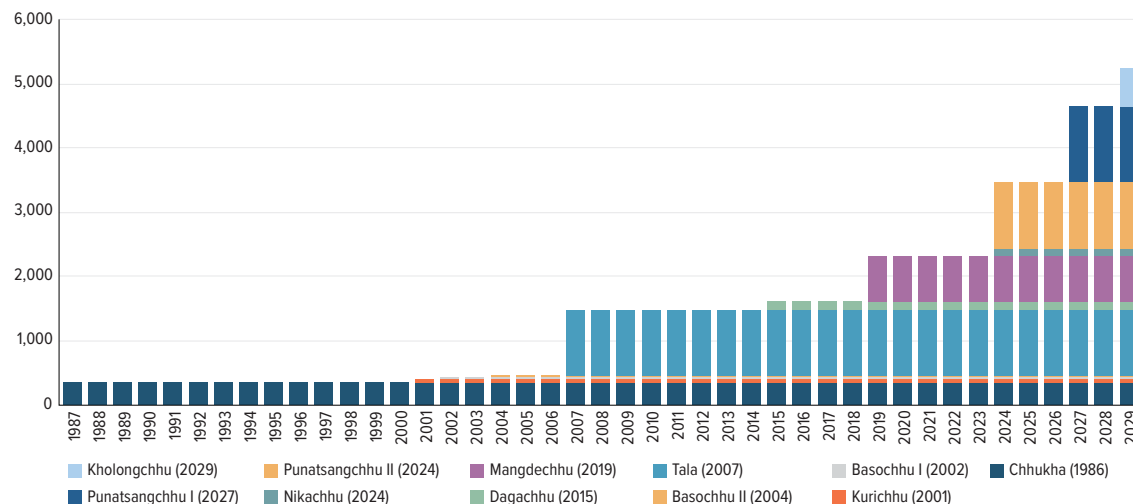
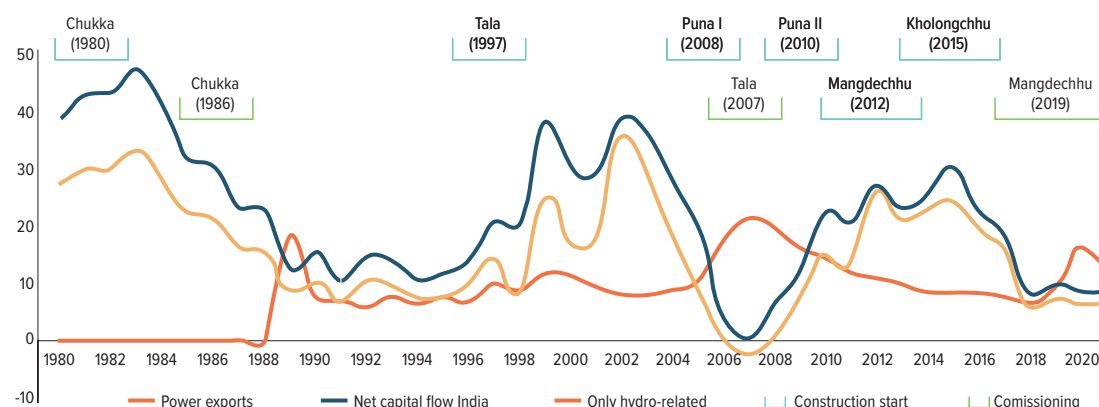


Figure 20: Net capital inflows from India and power export revenues (percent of GDP), 1980-2021



Note: Power exports vary due to changes in generation and domestic consumption given that all surplus generation is exported to India. Net capital inflows include budgetary grants, grants for hydropower development, and hydropower loans (disbursements minus reimbursement) from India. Net capital inflows, which consist of budgetary grants, grants for hydropower development, and hydropower loans from India, decrease with the commissioning of a new hydropower plant due to reduced inflows and increased outflows caused by debt servicing starting the year after commissioning.

The large capital inflows from the construction of hydropower projects and the subsequent export revenues have caused the Bhutanese Ngultrum to appreciate against the Indian Rupee. This has raised concerns about the Dutch Disease, where tradable sectors become less competitive compared to the booming hydropower sector due to appreciation of the real exchange rate. The contraction in the lagging tradable sector is known as the “spending effect”. Simultaneously, a “resource movement effect” occurs when resources (capital and labor) shift towards producing non-traded goods to meet the increase in domestic demand and the booming export sector, leading to a reduction in production in the lagging tradable sector (Corden and Neary, 1982).²⁶

26 Corden, W.M., and Neary, P.J. 1982. “Booming Sector and Deindustrialization in a Small Open Economy”. *Economic Journal*, 92, 825-48.



The hydropower-led growth model is characterized by the lack of economic diversification and adequate employment opportunities. While the hydropower sector contributed significantly to the economy, its capital-intensive nature led to the creation of very limited gainful employment opportunities, employing less than 1 percent of the labor force, despite accounting for 16 percent of GDP in 2021.²⁷ The reliance on hydropower has led to limited private sector development, with the bulk of the jobs concentrated in low-productivity agriculture and public administration. Large private-sector firms are rare; only 2 percent of firms hold limited liability company (LLC) status, and only 2 percent of firms attract foreign ownership.²⁸ Unemployment increased from an average of 2.8 percent between 2015 and 2019 to 5.9 percent in 2022 (Figure 6). The rise in unemployment rates since 2020 was mostly witnessed in urban areas, especially amongst young and educated women and men.²⁹ Bhutan's topography, landlocked and mountainous terrain, coupled with a small population (around 800,000), entails high transport costs, market fragmentation, and a limited size of the domestic market for goods and services.

The non-hydro sector largely consists of services and a narrow set of resource-intensive manufacturing. Annual non-hydro sector growth averaged 6.9 percent from 2001-2019, driven by services and non-hydro industry, mainly construction and manufacturing (ferro-alloy and ferro-silicon). Growth in services was driven equally by public administration (including health and education), trade and transport (accounting for 75 percent of growth), followed by the financial sector (including real estate). Since the beginning of tourism in 1974, Bhutan has targeted high value tourists to minimize the impact on the environment. The hotel and restaurant sector grew at an average rate of 16 percent per annum from 2001-2019, excluding the COVID-19 pandemic year when the tourism industry was severely hit.

This chapter focuses on the macroeconomic impacts of different diversification policies on managing the growing hydropower revenue. The rest of the chapter is organized as follows: Section 1.2 presents an analytical review of the hydro and non-hydro growth nexus, including a review of the current growth model, and its impact on the labor market and job creation. The section also analyzes the overall impact of the planned expansion in hydropower on the economy under a BAU scenario. In addition to the BAU scenario, two policy scenarios are simulated to examine the impact of the utilization of the additional hydro revenue for promoting economic diversification. Section 1.3 examines options to manage resource revenues and discusses economic diversification policies, as well as the institutional set-up for effectively channeling hydropower rents towards productivity-enhancing assets in Bhutan. Section 1.4 provides policy recommendations.

1.2. Bhutan's hydro and non-hydro growth nexus

1.2.1. Past growth has been driven by the publicly led and capital-intensive hydro sector

Growth was capital and labor intensive, with limited productivity improvements. A growth accounting analysis over two periods — (i) 2001-2008, which coincided with the commissioning of the Tala hydropower project in 2007, and (ii) 2009-2019, which witnessed the construction of several major hydro plants, up to the commissioning of Mangdechhu project in 2019³⁰ — indicates that capital accumulation and labor contributed 3.7 and 2.5 percent, respectively, on average, over the first period (Figure 21). However, the contribution of both capital and labor declined over the second period, and growth slowed from 8.6 percent to 5.8 percent. Total Factor Productivity (TFP) growth played only a minor role in driving growth and was lower than structural and aspirational peers, except Botswana, from 2000-2019 (Figure 26).

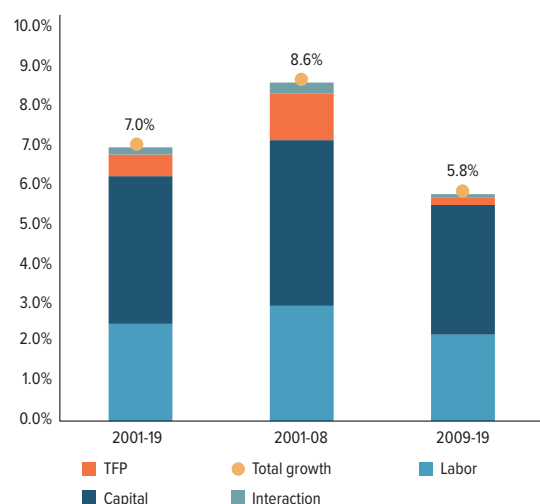
27 This excludes the construction sector, which is partly hydropower construction. The agriculture sector accounted for 19 percent of GDP, the industry sector (including hydro) for 34 percent, and the service sector for 47 percent of GDP in 2021. Measures in current prices.

28 According to the economic census, 90 percent of the firms in the country are small firms with 1-5 workers, while large firms with more than 100 workers are very limited (0.6 percent of total firms). Excluding household-based businesses in agriculture, the majority of establishments (91 percent) belong to the service sector, followed by the industry sector (7 percent).

29 Unemployment is significantly higher among youth (28.6 percent), educated workers (11.5 and 11.8 percent for workers with a secondary and tertiary diploma, respectively), in urban areas (10.4 percent compared to 3.4 percent in rural areas), and among females (7.9 percent compared to 4.4 percent for males). Alaref, J., et al. Forthcoming. "Bhutan Labor Market Assessment Report. Social Protection & Jobs Global Practice". World Bank, Washington, D.C.

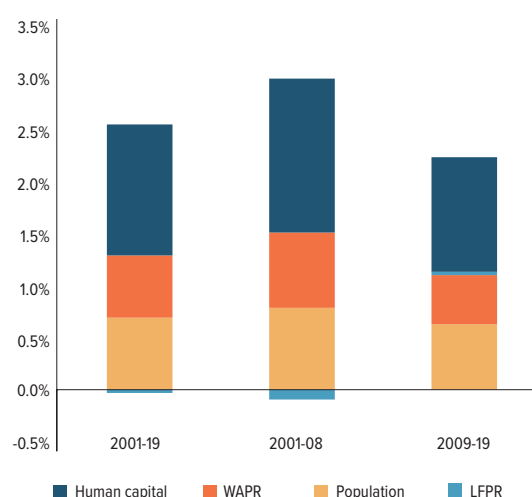
30 The growth accounting does not include the impact of the COVID-19 pandemic in 2020, given the unique situation. The economy contracted by 10 percent in 2020.

Figure 21: Growth decomposition, 2001-2019



Source: Growth accounting, World Bank staff calculations.

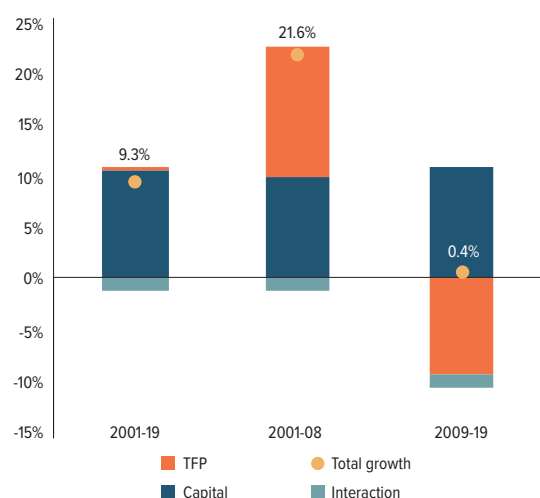
Figure 22: Labor contribution decomposition, 2001-2019



Source: Penn World Table, World Bank staff calculations.

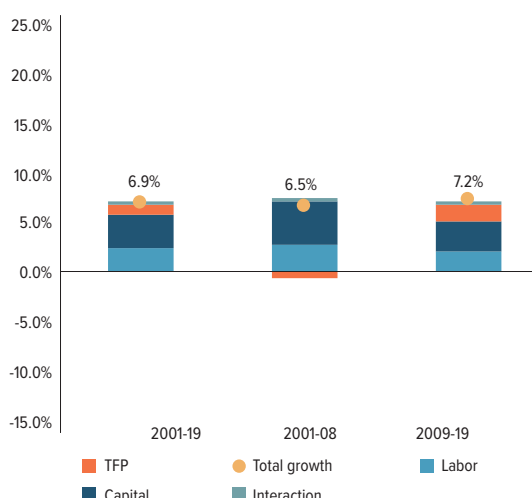
Hydro sector growth was driven by capital accumulation and increases in productivity once new projects were commissioned. The growth accounting exercise assumes that the output of the hydro sector is a function of capital and productivity (labor is only used temporarily during the construction period), while the output in the non-hydro sector is a function of labor, capital, and productivity (see Annex 1 for details). The analysis indicates that growth in the hydro sector from 2001-2008 (21.6 percent) was considerably higher than during the 2009-2019 period (0.4 percent) (Figure 23). Physical capital accumulation contributed 9.3 percent to this growth, on average, each year, in both periods, but productivity loss (measured by TFP as a residual) caused hydro output to decline by 9.2 percent each year from 2009-2019, as no new hydropower projects were commissioned over this period. Hydro projects are multi-year projects and new hydro investments are utilized after a significant time lag. The productivity growth in later years partially reflects this increase in capital utilization (Figure 25).

Figure 23: Hydro sector growth decomposition, 2001-2019



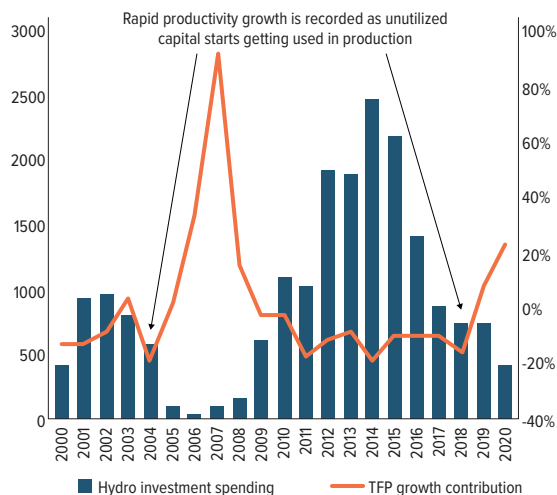
Source: Growth accounting, World Bank staff calculations.

Figure 24: Non-hydro sector growth decomposition, 2001-2019



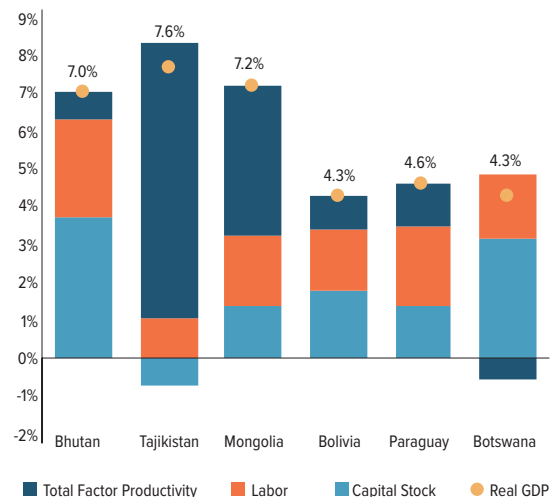
Source: Penn World Table, World Bank staff calculations.

Figure 25: Hydro investments and TFP growth, 2000–2020



Source: Growth accounting, World Bank staff calculations.

Figure 26: Bhutan vs. peers: contributions to growth 2001–2019



Source: Penn World Table, World Bank staff calculations.

Non-hydro growth was capital and labor intensive, with limited productivity improvements. Non-hydro sector growth from 2001–2019 was 6.9 percent, lower than hydro sector growth in the same period (9.3 percent) (Figure 24). Non-hydro capital accumulation, driven by public investments using the hydro rents and sizable external grants, contributed 3.4 percent on average from 2001–2019, but its contribution has waned over time. Labor contributed less than capital and the contribution declined over time (from 2.9 percent to 2.3 percent). Non-hydro sector growth increased from 6.5 percent in 2001–2008 to 7.2 percent in 2009–2019, mainly due to an increase in TFP, which offset the decline in capital and labor contributions.³¹

Among labor components, human capital was the dominant growth driver, though its contribution has declined over time. Human capital, measured by returns to level of schooling, accounted for about half of the overall increase in labor input but decreased in the second period (2009–2019). The other half was attributed to the growth in population and the working-age population ratio. Conversely, On the other hand, changes in labor force participation had a minimal impact (Figure 22). Labor force participation rates in Bhutan show significant disparities, particularly with lower participation among low-skilled women in urban areas (Figure 27). The labor force participation of prime-aged women is strongly influenced by factors such as marital status, the presence of young children, and the participation of other women in their family and community. Further, women in Bhutan tend to work in sectors with low productivity, and often as own account or family workers, and have limited access to private employment or public sector jobs.³²

Spillovers from hydropower investments on non-hydro growth have been limited. Hydro investments can generate income in the non-hydro sector through the supply of goods (e.g., construction materials) and services (e.g., labor used in construction). To assess spillovers from the hydro to non-hydro sector, the non-hydro sector output is split into a core and hydro-driven part (see Annex 1 for more details).³³ Over the past two decades, spillovers from hydro investments to non-hydro growth in Bhutan are estimated to be small, about 0.8 percentage points of 5.8 percent. But with rising hydro investments since 2009, the spillover has contributed 1.5 percentage points to the 5.3 percent growth recorded by the non-hydro sector in the second period (Figure 28). Spillovers remain limited because the hydro projects are mostly

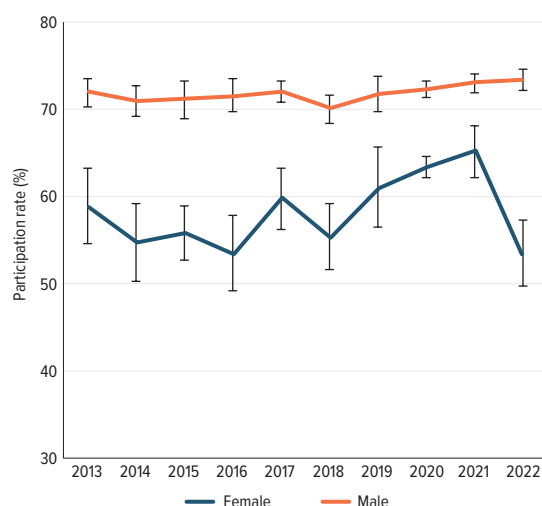
³¹ Bhutan currently does not have granular firm-level productivity data to assess possible explanations for the lagging productivity performance in the non-hydro sector.

³² Alaref, J., et al. Forthcoming. "Bhutan Labor Market Assessment Report. Social Protection & Jobs Global Practice". World Bank, Washington, D.C.

³³ To quantify the effect of hydro sector investments on the growth of the non-hydro sector, it is assumed that the hydro sector's capital expenditures generate income in the non-hydro sector through the supply of goods (e.g., construction materials) and services (e.g., labor used in construction). The incremental growth of the non-hydro sector is then assessed by comparing its actual output against a counterfactual scenario where hydro sector investments are absent. See Annex 1 for more details on the calculation of hydropower spillovers.

developed with (temporary) foreign labor from India and the majority of machinery and raw materials are imported.³⁴ More recently, some SOEs have provided goods and services to hydro projects, in particular for the plants developed under the Public Private Partnership (PPP) and Joint Venture (JV) models (Dagachhu, Nikachhu, Kholongchhu),³⁵ and some projects have used domestic labor during the COVID-19 pandemic due to restrictions on foreign workers.

Figure 27: Labor force participation rates by gender, 2013-2022



Source: Alaref, J., et al. Forthcoming. "Bhutan Labor Market Assessment Report: Social Protection & Jobs Global Practice". World Bank, Washington, D.C.

Figure 28: Spillovers from hydro to non-hydro sector, 2001-2019



Source: Growth accounting, World Bank staff calculations.

1.2.2. The private sector has remained small, with limited employment opportunities³⁶

Limited productivity gains have hindered structural transformation, and labor remains predominantly employed in the low productivity agricultural and public sectors. While the share of agriculture in GDP has declined significantly over the past two decades, dropping from 25 percent of GDP in 2000 to 12 percent in 2021, the share of services has increased from 37 to 50 percent. The contribution of the non-hydro industry sector, excluding electricity, has remained relatively stable at about 25 percent (Figure 29). Despite the decreasing share of agriculture in value-added, the labor force continues to be largely confined to the agricultural sector. In 2022, the labor market was mostly dominated by low-productivity agricultural employment (40 percent), followed by the public sector (25 percent, including education and health). Although more productive sectors like electricity, transport and communication, financial intermediation, and mining, have seen an increase in their share of total employment between 2013 and 2022, they still have a relatively small presence in terms of employment (Figure 30). Sectors like construction have grown in size but have lower productivity levels compared to smaller and slowly growing sectors.

The labor market is segmented based on gender, location, and education. Men and high-skilled workers in urban areas dominate public sector employment, while women are more likely to remain employed in agriculture and work as own-account or family workers. Workers with no education dominate agricultural employment and workers with tertiary education tend to self-select into the public sector.

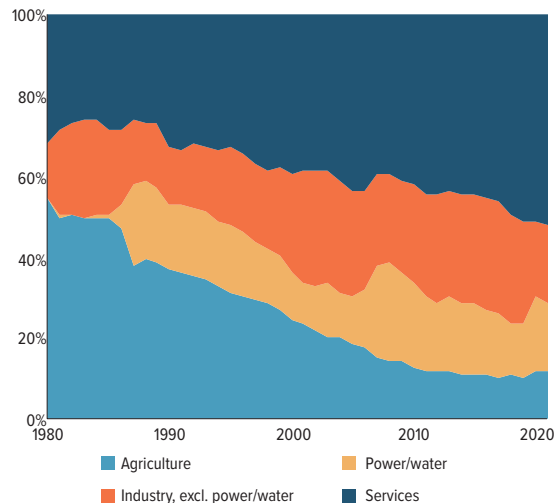
The private sector in Bhutan largely comprises low-productivity microenterprises, lacking dynamism, diversification, and productive job opportunities. In 2022, only 2.7 percent of firms were new, indicating a lack of entrepreneurial activity. These very small firms tend to remain small, likely due to restrictions on growth, and inefficient firms are not exiting the

³⁴ See Intergovernmental Agreement between the GoI and the RGoB, which states under Article 5 that "Except in regard to lower categories of staff and the labour force, the recruitment of technical, administrative and other personnel of the Authority will be confined to the nationals of either country." <https://www.mea.gov.in/bilateral-documents.htm?dtl/6349/Agreement>

³⁵ See Annual Report 2021 CDCL (Construction Development Corporation Limited), (file:///C:/Users/wb506822/Downloads/CDCL%20AR%202021.pdf), a fully owned SOE under DHI, and Annual Report 2021 Dungsam Cement Company Limited (CCDL) (file:///C:/Users/wb506822/Downloads/Annual%20Report%202021%20Final_compressed.pdf), a DHI controlled SOE.

³⁶ Based on Alaref, J., et al. Forthcoming. "Bhutan Labor Market Assessment Report. Social Protection & Jobs Global Practice". World Bank, Washington, D.C.

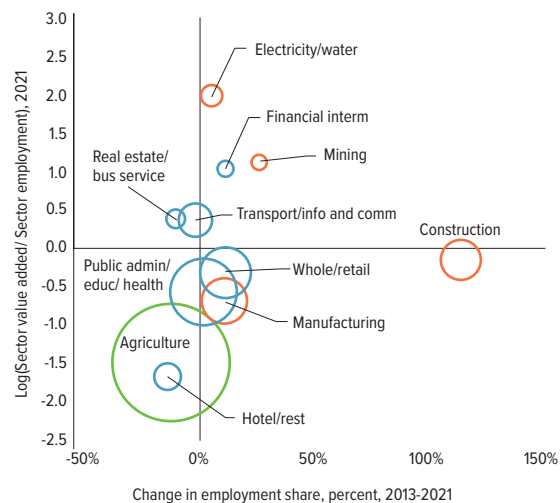
Figure 29: Sector shares in GDP, constant 2000 prices, 1980-2021



Source: National Statistics Bureau and World Bank staff calculations.

Note: The circle size in the right hand graph reflects sector employment in 2013. Productivity is measured as the sector-level value-added per worker in 2021.

Figure 30: Change in sectoral productivity and employment shares, 2013-2021



market. Between 2018 and 2022, firms became older and smaller, with the share of long-established firms increasing from 24 percent to 26 percent, and the share of cottage firms rising from 89 percent to 96 percent (Figure 31). Further, most firms (nearly 97 percent) are owned as individual proprietorships. In terms of employment, the average number of workers hired by firms decreased from 1.1 in 2019 to 0.7 in 2020 and 2021, indicating a decline in job opportunities within the private sector. Additionally, there is a lack of diversification in terms of economic activity, with the wholesale and retail trade, and accommodation and food services sectors accounting for nearly 80 percent of firms. These sectors typically have low labor productivity and employ low-skilled workers.

The private sector hires more individuals in low- and middle-paying occupations, in comparison to the public sector.

Own-account workers outside agriculture are mostly service and sales workers, whereas employers are mostly in high-skilled occupations, such as managers. The private sector accounted for 14 percent of total employment in 2022. Private employment was the most prevalent in construction (60 percent), administrative and support service activities (60 percent), and in arts, entertainment, recreation, and other service activities (66 percent). Apart from public administration and defense, public employment dominated in human health and social work activities (97 percent), and education (87 percent). Employees also worked in SOEs in the energy, water, and waste management activities, and financial and real estate activities (Figure 32).

The limited development of the private sector has resulted in a shortage of productive jobs for educated individuals.

The majority of employed workers are in low to mid-skilled positions, creating a disparity between the profile of job seekers and the available jobs. In 2022, approximately 58 percent (24 percent) of job seekers held a secondary degree (university degree), compared to 29 percent (9.5 percent) of employed workers, indicating an oversupply of educated workers (Figure 33). As a result, unemployment rates were high for individuals with secondary diplomas (11.5 percent in 2022) or tertiary diplomas (11.8 percent in 2022). This lack of productive jobs that offer competitive wages for educated individuals is likely contributing to emigration, especially among the most skilled workers, including those employed in the public sector.

As a result, unemployed workers, especially the youth, tend to prefer the public sector. In 2021, a higher percentage of youth (86 percent) compared to non-youth (75 percent) expressed a preference for public sector employment. The reasons for preferring public sector employment mostly relate to job security and working conditions. Youth place more emphasis on job security, with 83 percent citing it as the main reason for preferring public sector employment, compared to 74 percent of non-youth.

Figure 31: Establishment size and employment share, 2022

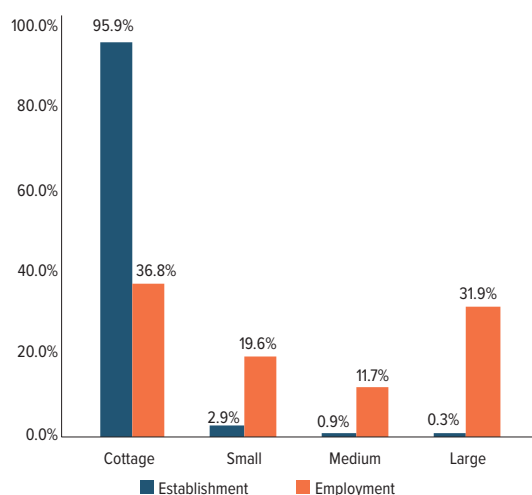


Figure 32: Type of employment, by sector (excluding agriculture), 2022

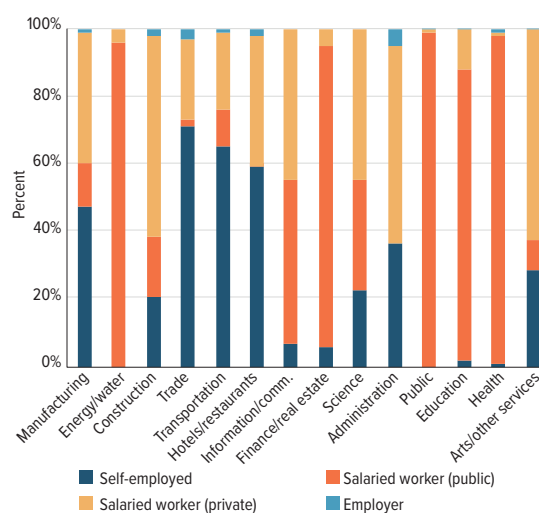
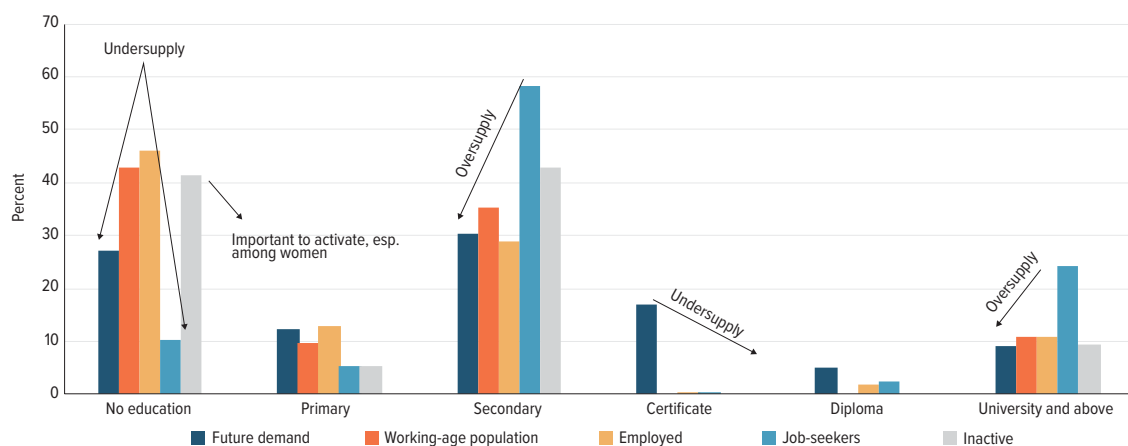


Figure 33: Comparison between the distribution of expected labor demand and the current labor force and inactive population (percent of total), by education, 2022



Source: Bhutan Labour Force Survey (BLFS) 2021, 2022. Establishment Survey, World Bank Labor Market Assessment Report. Forthcoming.

Conversely, the private sector is facing labor shortages due to a mismatch in skills and spatial distribution, which can impede growth and result in low productivity. Firms in Bhutan require workers with specific technical skills and lower levels of education, particularly in the services sector. However, accessing this labor is challenging because there is a high proportion of lower-educated workers, especially women, who are not in the labor force but could potentially fill these vacancies with appropriate training and support. The labor shortages also have a spatial dimension, where job seekers with the required qualifications, especially those with lower levels of education, are not located in regions experiencing supply shortages. For example, regions like Samdrup Jongkhar and Trashigang, both close to the Indian border, face the most hiring difficulties, with tight labor markets for non-educated workers and graduates with primary education. Firms also struggle to find workers with the necessary technical skills because of a lack of linkages with vocational training institutes. While some firms may consider hiring foreign workers to address the shortages, the percentage of firms doing so has declined over time, with only 7 percent hiring at least one foreign worker in 2022. Many firms have expressed that hiring difficulties have a negative impact on their performance and potential for growth.

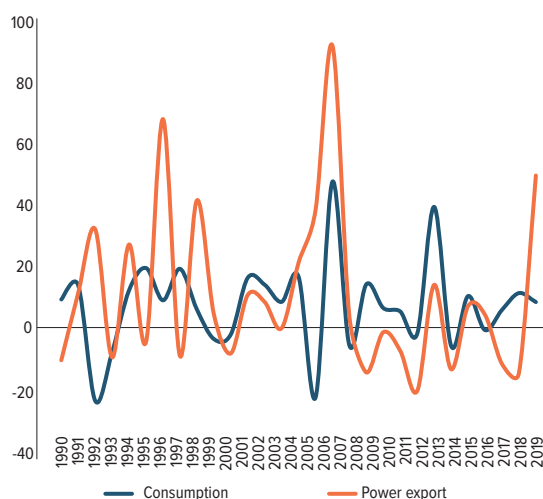


1.2.3. Economy-wide effects of the hydro sector and symptoms of the Dutch Disease

Despite limited spillovers from the hydro to the non-hydro sectors, large hydro resource rents could have impacted the competitiveness and diversification of the non-hydro economy. While hydro avoids certain oil-related symptoms (i.e., shocks after resource depletion, volatile tariffs, competition for a fixed amount of resources), the expansion of hydropower production in Bhutan shares characteristics with the discovery of fossil reserves due to the large foreign currency inflows from hydropower exports. Resource-dependent economies are known to experience Dutch Disease with large foreign currency inflows leading to an appreciation of the real exchange rate that adversely affects (non-booming) export sectors. This section assesses the economy-wide effects of the booming hydro sector, and its impact on the growth of the non-hydro sector, by examining past trends and projecting a forward-looking scenario using a CGE model.³⁷

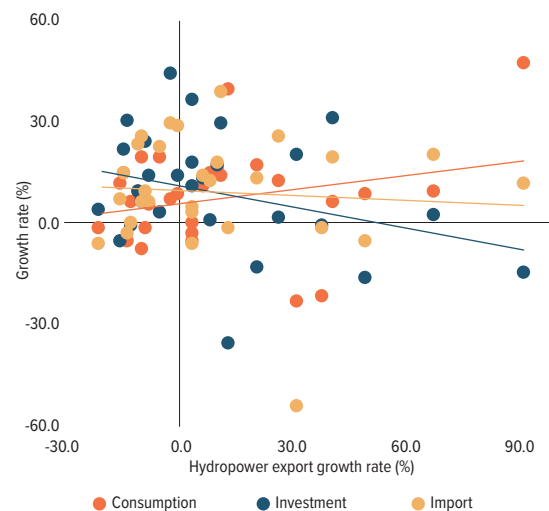
Hydro rents have been absorbed by the economy through an increase in private and public consumption. Hydropower export revenues are transferred from the hydro SOE Druk Green Power Corporation (DGPC) to the Central Government as general government revenue in the form of Corporate Income Tax (CIT), royalties, dividends, and profit transfers. A small fraction is transferred into the Bhutan Economic Stabilization Fund (BESF), and the majority is used to cover the current and capital expenditure of the general Government (i.e., public sector wages, health, education, public investment). Meanwhile, a portion of the rents accrues to Druk Holding and Investments (DHI), which uses a part of it to cross subsidize and invest in other SOEs. Both private and public consumption correlate positively with power exports (Figure 34). Public investment is negatively correlated, and private investment and imports demonstrate no correlation with power exports (Figure 35). This indicates that hydro-related revenue has not resulted in significant increases in private investment or imports.

Figure 34: Percent change in power exports and consumption (in constant 2000 prices), 1991-2019



Source: National Statistics Bureau and World Bank staff calculations

Figure 35: Correlation of power exports with consumption and investment (annual data), 1991-2019



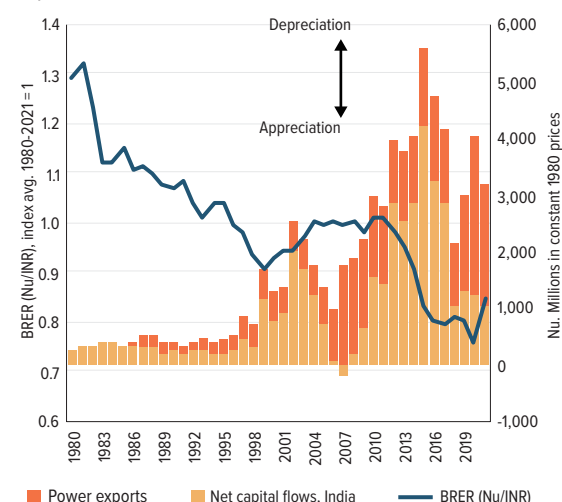
Source: World Bank staff calculations.

Note: The correlation coefficients for private and public consumption are 0.26 and 0.21, respectively. The correlation coefficient for private investment is 0.02, while for public investment it is -0.39. The correlation coefficient for imports is -0.07. These coefficients remain relatively stable even when considering lags.

37 While the first economic census from 2018 includes data on establishments, such as size and economic activity, it does not include firm-level output data.

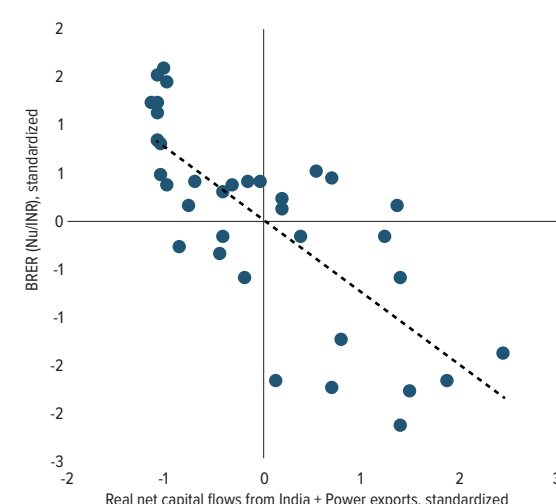
The Bhutanese Ngultrum (BTN) has experienced an appreciation against the Indian Rupee (INR) due to capital inflows and export revenues. The starting point for examining Dutch Disease effects is to estimate the resultant change in the real exchange rate. Under Bhutan's fixed exchange rate regime, the large inflows are expected to increase domestic demand and prices, leading to an appreciation of the real exchange rate. Figure 36 and Figure 37 illustrate the bilateral real exchange rate (BRER) with India, power exports to India, and net capital flows from India.³⁸ There is a negative correlation between hydro-related inflows and the BRER with the INR. From 1980 to 2000, the BTN appreciated vis-à-vis the INR, coinciding with the construction of the Chhukha project (the first large hydropower project) and subsequent hydro exports. The BRER remained relatively stable until 2012, despite a significant increase in hydro exports. However, in the last decade, the rate of appreciation has accelerated, coinciding with significant net capital flows for the construction of Mangdechhu, Puna I and Puna II projects.

Figure 36: BRER with India (Index average 1980-2021 = 1), real power exports and real net capital inflows from India, 1980-2021



Source: National Statistics Bureau and World Bank staff calculations.

Figure 37: Correlation of BRER with India with the sum of capital inflows and export revenues, 1986-2021



Source: World Bank staff calculations.

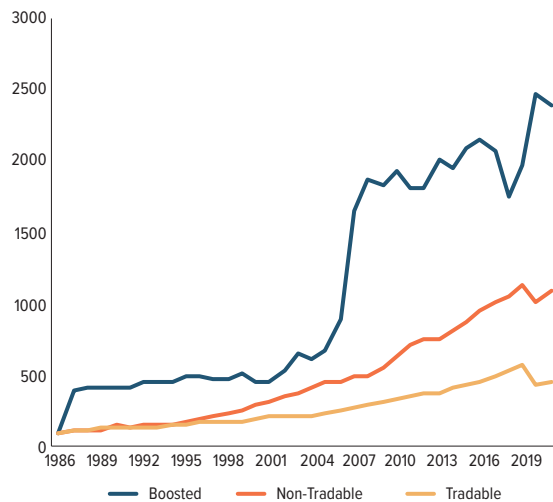
Note: The correlation coefficient for real power exports and real net capital inflows from India is 0.76.

In Bhutan, both the non-tradable and tradable sectors have exhibited lower growth and output levels compared to the booming electricity sector. Dutch Disease-type effects typically lead to a shift towards non-tradable services and a reduction in the size of the lagging tradable sectors. In Bhutan, the output of the tradable sector, including agriculture, mining, and manufacturing, has remained below that of the non-tradable sector as well as the booming electricity sector (Figure 38). Although there has been notable growth in non-hydro exports, this growth has been driven by mineral products such as boulders and base metals like ferro-alloy and silicon. In contrast, other exports have shown limited progress, indicating a lack of economic diversification (Figure 39). This suggests that hydropower exports and hydro-related capital inflows may have stymied the growth of the lagging tradable sector relative to the non-tradable sector. An earlier study by Kojo (2005) did not find evidence of contraction or stagnation in the tradable sector.³⁹ However, the study suggested that the non-tradable sector may have experienced faster growth if the BTN had not appreciated and that future expansion of hydro exports or aid inflows could further pressure the BTN and negatively impact the tradable sector. The evidence in the previous paragraph shows that this has indeed been the case.

³⁸ The real exchange rate, RER, is defined as the nominal exchange rate, ER, multiplied by the ratio of the index of non-domestic prices, p_{w_ind} , to the index of domestic prices, p_{dom} . $RER = ER \cdot \frac{p_{w_ind}}{p_{dom}}$. A fall in the real exchange rate index is an appreciation in the real exchange rate.

³⁹ Kojo (2005) investigated the Dutch Disease effects in Bhutan and found that hydro exports led to the appreciation of the BTN. While there was no evidence of contraction or stagnation in the tradable sector, the study highlighted important caveats. First, the lagging non-tradable sector may have grown faster without the real appreciation of the BTN. Second, limited labor mobility between the tradable and non-tradable sectors, especially for farmers in remote areas, may have hindered relocation to the capital city. Third, agriculture's subsistence-based nature may exclude it from being considered a tradable sector in Bhutan. The study also suggested that future expansion of hydro exports or aid inflows could further pressure the BTN and negatively impact the tradable sector. See Kojo, N. 2005. "Bhutan: Power Exports and Dutch Disease". The Centre for Bhutan Studies, Thimphu, Bhutan.

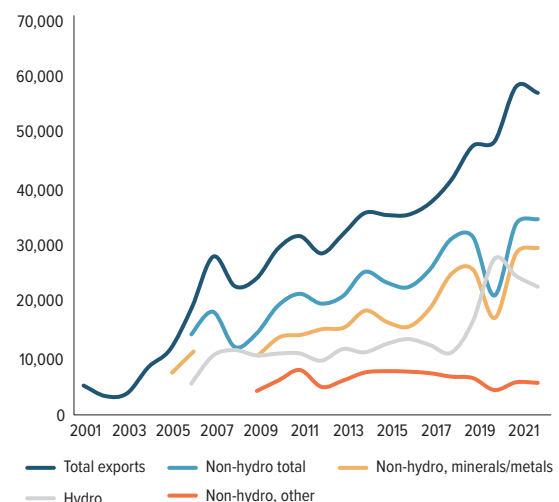
Figure 38: GDP growth by economic activity
(Index, 1986=100), 1986-2021



Source: NSB and World Bank staff calculation.

Note: Boosted: electricity and water; Tradable: crops, livestock, mining, manufacturing; Non-tradable: forestry, construction, services.

Figure 39: Hydro and non-hydro goods exports
(in million Nu), 2001-2022



Source: NSB.

Note: Non-hydro goods exports consist of minerals and metals exports (Bhutan Trade Classification, Section V and XV, respectively), as well as other exports.

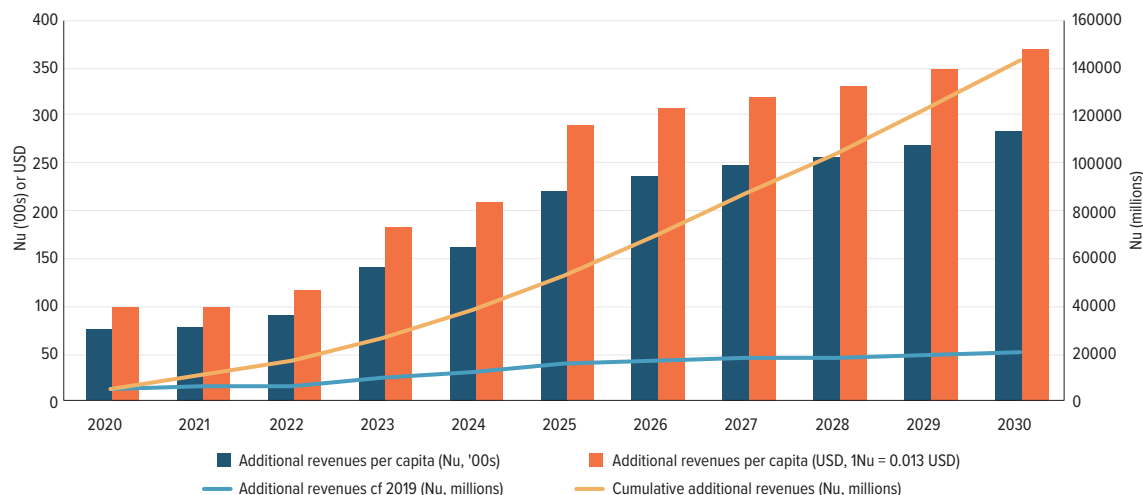
Four scenarios are simulated to analyze how hydro revenues impact the real economy, taking into account assumptions about their future utilization. A CGE model, calibrated to a Social Accounting Matrix (SAM) for Bhutan in 2019, is used to simulate the following scenarios:⁴⁰

- **Scenario 1: No additional hydropower.** This scenario assumes that investments in hydropower end in 2020.
- **Scenario 2: Additional hydropower investments.** This scenario includes the construction and commissioning of four planned hydropower projects: Punatsangchhu I, Punatsangchhu II, Nikachhu, and Kholongchhu. The additional planned investment results in an expansion in hydro capacity and production after 2023 and 2025 (Figure 41). The Puna I and Puna II projects are expected to generate additional revenue per capita, from 12,652 Nu (US\$164) during the construction phase to 25,702 Nu (US\$334) during the revenue phase. While there are other hydropower projects in the pipeline, including the Dorjilung hydropower project that will likely come online after 2030, this scenario assumes that no additional projects are planned after 2025.
- **A comparison of Scenario 1 and Scenario 2 demonstrates the impact of the planned hydropower projects on the economy (the Dutch Disease).**
- **Scenario 3: Scenario 2 with hydropower rents invested in physical and human capital.** This scenario is identical to Scenario 2, but with the assumption that public policy is used to diversify the economy by investing additional hydro revenues in human and physical capital accumulation, rather than in general public spending on wages, goods and services. Additional revenues are split equally between (i) focused education expenditures such as skills training to improve labour productivity; and (ii) capital investments through government savings. **A comparison between Scenario 3 and the reference Scenario 2 shows the impact of allocating additional hydropower revenues towards a diversification policy.**⁴¹

⁴⁰ The detailed results are reported in Shutes, F., and McDonald. 2022. CEM Background Paper. World Bank, Washington, DC.

⁴¹ Compared to the BAU scenario, additional hydropower rents are redirected from general government spending towards investments in human and physical capital. A stylized approach is taken in which additional revenues are split equally between spending on training, resulting in labor productivity improvements, and spending on capital investments via government savings. The CGE scenarios are indicative and aim to demonstrate broad trends and trade-offs.

Figure 40: Additional hydro revenues after 2019 in the reference scenario, 2020–2030



Source: Shutes, F., and McDonald. 2022. CEM Background Paper, World Bank.

- Estimates from the CGE model indicate that channeling additional hydropower revenues into physical and human capital, specifically through focused educational expenditures such as skills training, leads to labor productivity improvements and enhances capital accumulation.
- **Scenario 4: Scenario 2 with hydropower rents distributed through fiscal transfers – a Basic Income Grant (BIG).** A least cost allocation of hydro rents is assumed, whereby the Grant is assumed to be untargeted and unweighted, such that all individuals receive an equal per capita payment. No explicit welfare objective is associated with the allocation of rents. **A comparison of this scenario with the reference Scenario 2 shows the impact on the economy of targeting additional hydropower revenues on fiscal transfers, instead of funding government efforts to create human or physical capital.**⁴²
- **Scenarios 3 and 4 capture the impacts stemming from two different policies related to the utilization of hydropower revenues with the aim to diversify the economy.**

Scenario 3 presents a growth model that utilizes hydropower rents to finance key investments, while Scenario 4 simulates a situation where the rents are channelled to households through direct fiscal transfers. Scenario 3 captures policies to facilitate the availability of factor inputs, including human capital, infrastructure, and physical capital, technological know-how, institutional quality such as macro stability and the regulatory environment, removal of trade barriers, and access to financing.⁴³ In Scenario 4, the idea is to make growth more inclusive through a universal BIG. The concept of distributing resource revenues directly to citizens through cash transfers is often advocated as a means to improving accountability; it encourages citizens to monitor resource income and widens the opportunity for citizens to invest in human capital. A few resource-rich states, such as Alaska or Alberta (Canada), have implemented citizen dividend schemes.

Scenario 1, with no additional hydropower investments, exhibits the lowest growth rate. The primary sectors expand without the additional hydropower projects, resulting in a broader economic base (Figure 42). As a result, real household consumption per capita increases because capital growth is distributed more evenly across the economy, even though it is lower without the additional investment in hydropower. The shift in labor demand resulting from greater

⁴² The implementation of the Basic Income Grant (BIG) does not account for administration costs as these are unknown. As such the results should be viewed as an outer bound on the likely impacts of the policy.

⁴³ Lian, W, et al. 2021. "A Diversification Strategy for South Asia". IMF, Washington, DC. While the scenario does not specify where and how to invest the resources (see section 1.3.2 for discussion on sector-specific policies), it can assess whether the growth model can outweigh the impact of the hydropower expansion through the real exchange rate effects (Dutch Disease-type effects) by comparing the economy with the reference scenario, as well as the no-additional hydro scenario.



diversification leads to a more balanced rate of wage growth across sectors compared to Scenario 2. Urban households benefit from higher capital returns, which boosts their consumption growth. Where additional hydropower is present, all households experience higher consumption levels compared to Scenario 2.⁴⁴ However, without additional hydropower plants, electricity production and exports decrease significantly, leading to lower hydropower revenues and government consumption growth. This, in turn, affects education and health spending, resulting in a slower rate of future human capital accumulation.

The results from Scenario 2 align with Bhutan's previous experience, indicating that the economy would grow more rapidly with the additional hydropower investments, but diversification would be limited. The heavy reliance on hydropower has stymied economic diversification and job generation. In Scenario 2, the anticipated doubling of the hydro generation capacity is expected to result in higher growth, albeit at the cost of higher economic concentration due to Dutch Disease-type effects. This includes higher net exports, appreciation of the real exchange rate, and constraints on the growth of non-hydro sectors (except construction), as well as lower domestic absorption and household consumption. This is reflected in an increase in the index of economic concentration, indicating a less diversified economy by 2030 compared to Scenario 1, where no additional hydropower is assumed.⁴⁵

The CGE model shows that Dutch Disease-type effects are evident in the tradable service sectors. The non-hydro export sectors related to tourism, such as airport transport, hotels and restaurants, and travel agencies, are significantly affected by spending and resource movement effects. The contraction in the tourism sectors is led by a strong reduction in export demand, compounded by falling intermediate demand from interlinked contracting sectors.⁴⁶ Electricity production is projected to increase by 122 percent from 2019 to 2030, with a significant portion of the additional supply being directed towards meeting export demand, which is expected to grow by 138 percent (8.2 percent per annum) (Figure 122, Annex 2). The remaining three sectors to benefit from the expansion in hydropower are all non-tradables linked to the hydropower sector: electricity distribution, hydropower construction, and public administration (Figure 43).⁴⁷

GDP growth is highest in Scenario 3. Higher government spending in human as well as physical capital results in an increase in productivity through higher supply of labor and capital. The economy is more diversified as indicated by the lower concentration index compared to Scenario 2 (Figure 42, and Annex 2). The labor intensive industrial and construction sectors benefit most in terms of value-added, but there is also higher growth in all sectors through the direct factor effect and indirect spending effect via higher household consumption (as evident in the higher growth of domestic absorption compared to both Scenario 2 and Scenario 4). Households benefit from the investments, with higher growth in consumption across all household types compared to Scenario 2.

Scenario 4 results in a more diversified economy but also results in lower growth compared to reference Scenario 2 and Scenario 3. Many sectors that stagnate in Scenario 2 receive a boost, which results in a more diversified economic base. Agriculture, natural resources, food and beverages, and industry sector exhibit higher growth due to the pattern of household consumption. This is so because non-poor agricultural households receive a boost to agricultural incomes through higher land and capital returns, in addition to the large BIG transfers. The service sector experiences lower growth compared to Scenarios 2 and 3 due to reduced government service spending. However, export-led services increase, compared to Scenario 2, albeit to a smaller extent compared to Scenario 3. Given that non-poor agricultural households

44 Scenario 2 leads to an increase in real household consumption per capita, but the distribution of benefits is uneven. Wage rates and returns to capital grow moderately, except in agriculture. Agricultural households experience the lowest consumption growth due to slower growth in the agricultural sector. Urban households, which contribute significantly to private savings, experience income growth but increase their savings, keeping consumption levels close to 2019 levels. Urban households play a key role in raising private investment funds as total non-hydro investment increases.

45 An index of economic concentration, akin to the Herfindahl-Hirschman index used to measure market concentration. The index of economic concentration is equal to the squared share of each activity's output, QXa, in total output expressed as an integer, summed across all activities. For the 29 activities considered, the limits of the index are 344 if all activities contribute equally to production, and 10,000 if only one activity produces all output.

$$Economic\ concentration_{i,t} = \sum_a \left[\left(\frac{QX_{a,t}}{\sum_a QX_{a,t}} \right) \cdot 100 \right]^2$$

46 The manifestation of Dutch Disease effects in the CGE model is in the export-led service sectors. This is in line with the findings of Benjamin et al. (1989), who show that it is the exportable sector that suffers, whether that be manufacturing in developed countries, agriculture in developing countries, or, for Bhutan, tourism services. The non-tradable sectors will also see a slowdown in growth, although lesser compared to the export sectors. This is in line with the Dutch Disease-type effects where non-tradable sectors which do not compete with imported goods and services are less affected from the appreciation of the real exchange rate and benefit from the growth in national income from the booming resources sector. Exceptions to this are the finance, telecommunications, and utilities non-tradable sectors. Bhutan's strategy of high value, low volume tourism is sensible as it focuses on tourists that are likely to be less sensitive to price increases from the appreciation of BRER. See Benjamin, N.C., Devarajan, S., and Weiner, R. 1989. "The 'Dutch' Disease in a Developing Country. Oil Reserves in Cameroon." *Journal of Development Economics*, 30, 71-92.

47 The expansion of the hydro projects would lead to an almost doubling of labor demand and share of labor in the electricity sector by 2030 (albeit from a small share of labor in 2019 to 4.6 percent in 2030). The movement of labor into public administration following hydropower investment is in line with the findings of Norbu, N. 2017. "Diagnosing the Dutch Disease: Are the Symptoms Present in Bhutan?" Munich Personal RePEc Archive (MRPA) Paper No. 93249. Munich, Germany.

comprise approximately half the population, this impact, alongside the induced diversification of the economy, makes BIG an attractive policy to consider, if the slower growth in the services sector can be addressed (see Annex 2 for more details on BIG).⁴⁸

However, the interventions outlined in Scenarios 3 and 4 are not sufficient to outweigh the adverse effects of the Dutch Disease on the non-hydro sectors. The performance of non-hydro sectors including the export-oriented service sector, which was significantly affected by the Dutch Disease-type effects, is stronger compared to the hydro-led reference Scenario 2, but weaker compared to the no additional hydro Scenario 1. The type of policies modeled in Scenario 3 need to be supported by other policies to foster economic diversification in Bhutan. First, Bhutan's landlocked nature and the mountainous local topography result in high transport costs and market fragmentation. Transport costs can be reduced by investments in transport infrastructure but the absence of a coastline limits scope for export opportunities. Second, the population is small, resulting in a small domestic market for goods and services. Such economies need to look more to the engine of external (global) demand than internal (domestic) demand for their prosperity. Additionally, while a fiscal transfer program may be easier to implement, it does not necessarily ensure the required investments for economic diversification, as it may predominantly encourage higher consumption rather than investment.

Therefore, Bhutan may need to implement targeted policies to foster the development of tradable sectors instead of relying solely on creating an enabling environment for the spontaneous emergence of a sophisticated export sector. In this spirit, the next sections discuss options to effectively utilize additional hydro rents for enhancing domestic investment, followed by a discussion on complementary policies to mitigate the effects of the Dutch Disease and promote economic diversification.

Table 3: Economic development in different scenarios, 2030

	2019	Scenario 1: No hydro	Hydro-led scenario 2:	Scenario 3: Physical and human capital	Scenario 4: BIG
GDP	180.9	260.8	280.6	293.3	277.1
Domestic absorption	205.2	292.8	271.3	292.7	264.1
Savings	69.2	98.2	98.2	107.8	98.2
Hydro production (real)	20.2	23.5	44.7	45.6	45.1
Non-hydro production (real)	257.0	354.6	331.3	350.3	334.4
Economic concentration index	623.0	685.8	725.6	722.2	719.5
Government consumption	32.6	47.7	56.1	50	34.7
Household consumption per-capita (in thousands of Nu)	129.8	184.5	147.3	169.8	165.3

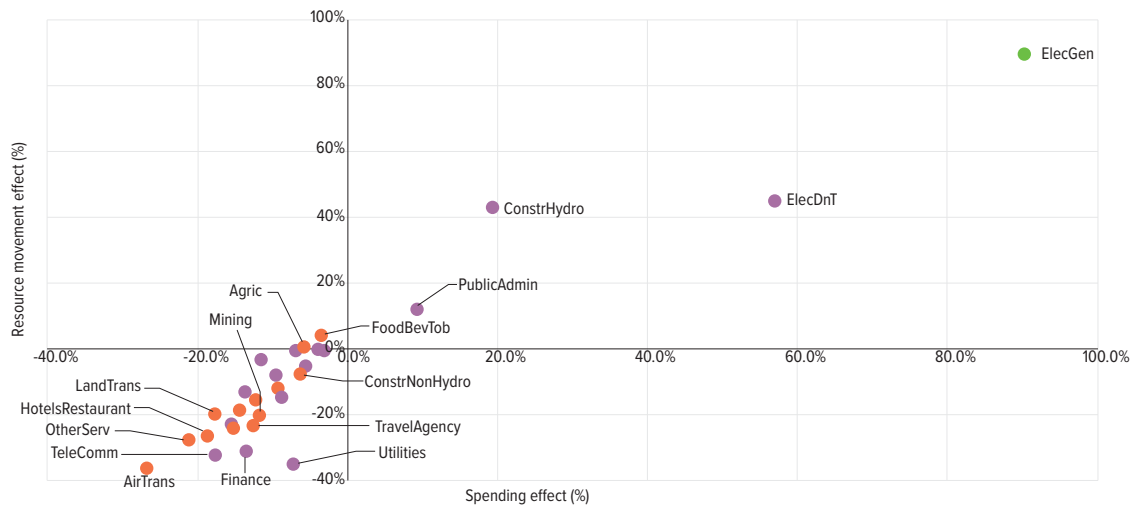
Source: Shutes, Feuerbacher and McDonald. 2022. CEM Background Paper, World Bank.

Note: All figures in Nu billions unless otherwise indicated. Please note that estimates are indicative and should not be interpreted as actual growth estimates.

48 Services sector includes trade, hotels and restaurant, land transport, air transport, travel agency, telecommunication, finance, public admin, education, health, and other services.



Figure 41: Dutch Disease-type effects (spending and resource movement), 2030



Source: Shutes, Feuerbacher and McDonald. 2022. CEM Background Paper, World Bank.
Note: green – booming resource sector, orange lagging export sector, purple – non-tradable sector.

1.3. Economic diversification in Bhutan: a framework for managing hydropower rents

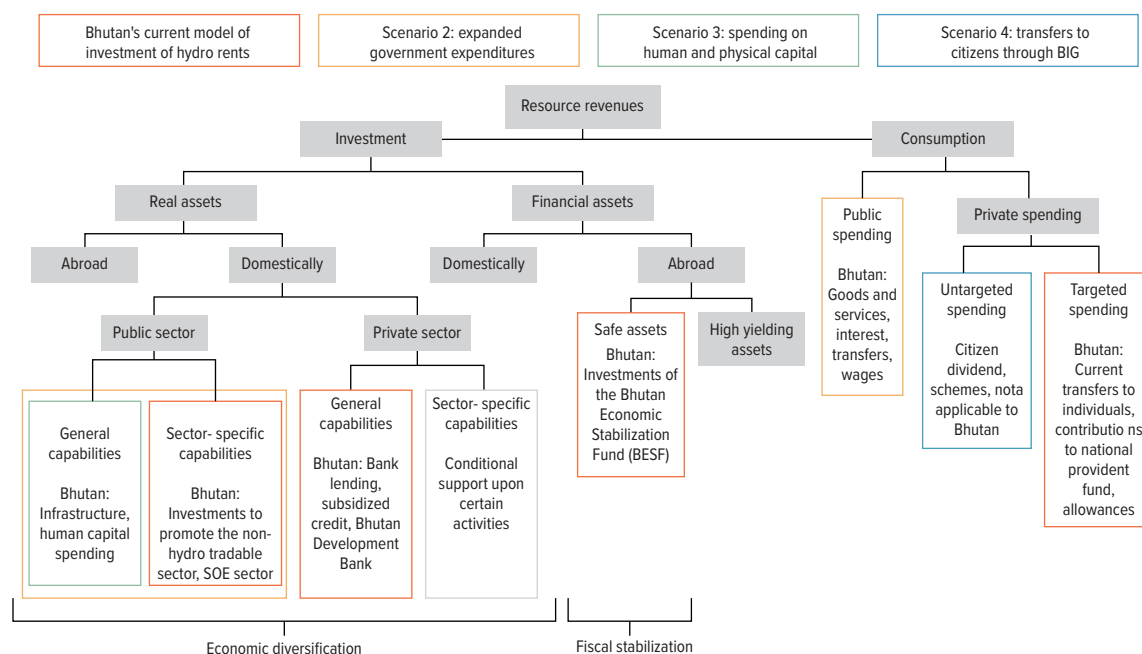
1.3.1. The case for investing domestically

There are different options to manage resource rents (Figure 42). Resource revenues can be consumed or invested. First, the Government can use the resource revenue for public or private spending through citizen dividends, subsidies, and the tax/benefits system, which would increase domestic consumption. Second, resource revenues can be invested in financial assets domestically or abroad, which can be used as savings for future generations or as a means of fiscal stabilization if invested in low-risk assets (as has been done by Chile's government, Botswana's Pula Fund and Norway's Pension Fund, and as anticipated by Bhutan's BESF). Third, resource revenues can be invested in real assets through the public sector or private sector in the form of subsidized credits, production or export subsidies, or by reducing public debt.

The framework for the efficient management of natural resource revenues to mitigate potential Dutch Disease-effects needs to consider several factors. There are two broad strategies to address Dutch Disease-effects: (i) smoothening of the spending of revenues earned from the export of natural resources, which can be achieved through the creation of a fiscal stabilization or sovereign wealth fund; (ii) promoting economic diversification into new sectors and industries. Greater economic diversification, in turn, is associated with lower growth volatility and higher long-term average growth in small states.⁴⁹ This is important for small economies like Bhutan, which are especially vulnerable to external shocks because of their remoteness, trade openness and economic concentration, and susceptibility to natural disasters and climate change. There is no consensus in the literature on the optimal resource revenue management framework, but several factors have been identified as important:

49 McIntyre, A., et al. 2018. "Economic Benefits of Export Diversification in Small States." IMF Working Paper WP/18/86, IMF, Washington, D.C.

Figure 42: Pathways for managing resource revenues



Source: Adaptation from Chang, H. J., and Lebdioui, A. 2020.⁵⁰

- i. **Nature of resource rent (temporary or permanent):** If resources are expected to be depleted rapidly, policymakers may want to protect the vulnerable sectors through fiscal stabilization and the buildup of official foreign exchange reserves to insulate the economy from the time-bound and short-run disturbances of Dutch Disease. If resources are likely to be permanent, policymakers may want to boost productivity in the nontraded goods sector and diversify exports to reduce dependence on the booming sector and make them less vulnerable to external shocks, such as a sudden drop in commodity prices (IMF, 2023).⁵¹
- ii. **Degree of resource dependence:** The more dependent a country is on a resource, the more urgent the need for diversification, as the economy is vulnerable to the fortunes of the resource sector.
- iii. **Levels of resource rents per capita:** Low resource rents per capita (i.e., below US\$600) can often entail a high opportunity cost of investing in financial assets overseas, given that their returns are unlikely to free up sufficient capital for domestic investment, in contrast to high resource rents per capita countries (e.g., Norway, Canada, United Arab Emirates (UAE), and Australia).
- iv. **Institutional capacity to invest:** The efficiency of 'riskier' investments in domestic real assets is heavily influenced by the domestic capacity to appraise, monitor, and evaluate investment projects. Weak capacity carries the risk that the resource rents will not be invested effectively and would have been better saved.
- v. **The level of public savings:** The savings rate determines the ability of the country to invest domestically. A country with high savings has greater protection against shocks and can allocate more revenues to investments.

50 Chang, H. J., and Lebdioui, A. 2020. "From Fiscal Stabilization to Economic Diversification: A Developmental Approach to Managing Resource Revenues". WIDER Working Paper 2020/108. UNU-WIDER, Helsinki, Finland.

51 IMF. 2023. "Dutch Disease: Wealth Managed Unwisely." Back to Basics Compilation, IMF, Washington, DC.

- vi. **Domestic investment rates and deficit:** Investment deficits (including low spending on human capital, education or Research and Development [R&D]) increase the opportunity costs of saving resource revenues (e.g., in financial assets overseas) as funds would not be available for domestic investments to improve productive capabilities.

There are important tradeoffs, including high opportunity costs of over-investing in stabilization funds at the expense of social spending and investment in domestic productive capabilities. Fiscal savings in stabilization funds (often in the form of holding liquid overseas financial assets) have a high opportunity cost given that the funds would not be available for domestic investment in the acquisition of productive capabilities that can foster economic diversification. Although increased government spending can generate demand pressures on non-traded goods, leading to a real appreciation and a decline in traded-good production, efficient public investment can also raise productivity in non-resource tradable sectors, counteracting the Dutch Disease. Box 1 discusses the contrasting resource management frameworks in Malaysia and Chile. While Malaysia has converted natural wealth into productive capital assets, Chile has used its natural resource rents to pursue fiscal stabilization and savings for future generations.

Bhutan's high resource dependence, low resource rents per capita, and a domestic investment deficit indicate the importance of using hydropower resources to invest in economic diversification. Despite Bhutan's high dependence on natural resources, the country has a relatively low resource rent per capita of US\$400, compared to other resource-rich countries like Norway and UAE (Table 4). Although Bhutan has a high share of gross fixed capital formation, which serves as a proxy for investment, it masks the significant investment needs in key social and infrastructure sectors. The human capital index for Bhutan reveals that a child's productivity in adulthood is only 48 percent of what it could have been with access to complete education and better healthcare.⁵² Additionally, Bhutan ranks 97th out of 139 countries in the World Bank's 2023 Logistics Performance Index (LPI), indicating lower infrastructure quality compared to other nations. Given the urgent need for economic diversification and the country's modest savings rates, there is substantial potential for investing hydropower rents domestically.

Table 4: Factors to consider for the resource revenue management framework

Factors	Description	Bhutan	Malaysia	Chile	Norway	UAE
Degree of Resource dependence	Total natural resource rents (% of GDP) (average; 2017-2021) ¹	2.6+10.1 ² (12.7)	6.2	7.2	6.6	15.8
Levels of resource rents per capita	Total natural resources rents (US\$ per capita) (average; 2017-2021)	84+320 ² (404)	671	1,113	5,326	6,931
Domestic investment rates and deficit	Gross capital formation (percent of GDP) (2017-2021)	41.3	22.5	23.8	28.3	23.4
	Gross savings rate (percent of GDP) (2017-21)	21.3	25.8	19.6	34.7	--
	Government expenditure on education (% of GDP) (2017-2021)	6.6	4.3	5.5	2.7	7.4
	Government expenditure on health (% of GDP) (2017-2021)	2.8	2.0	4.9	9.0	2.5
	Human capital index (2020)	0.48	0.61	0.65	0.77	0.67
	Learning adjusted years of schools (years) (2020)	6.3	8.9	9.4	11.2	9.6
	LPI score (and rank, out of 139 countries), 2022	2.5 (97)	3.6 (26)	3.0 (61)	3.7 (19)	4.0 (7)

Source: World Bank, World Development Indicators, Human Capital Project, Logistics Performance Index (LPI) 2023, and World Bank staff calculation.

Note: ¹Total natural resource rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. ² For Bhutan, hydropower exports have been included

Bhutan's current hydropower revenue management involves a mix of consumption and investment. Over the past five years, the majority (54 percent) of domestic revenue, 40 percent of which is generated from hydropower, was consumed through public recurrent spending in the form of wages and the provision of goods and services. Private spending accounted for 18 percent and was directed to social transfers, including allowances and contributions to the

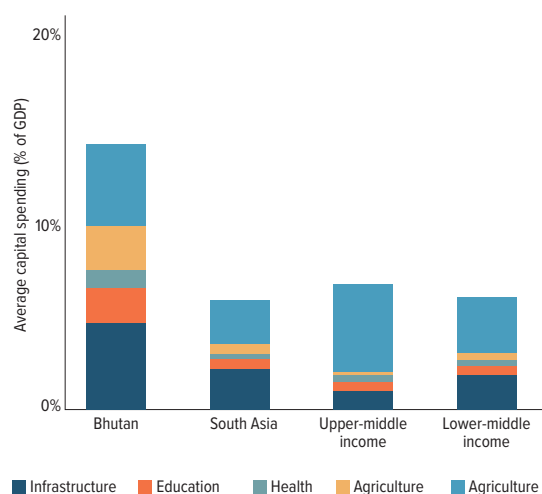
52 Human Capital Project. World Bank. 2020. "Human Capital Index Report". Human Capital Project, World Bank, Washington, DC. <https://www.worldbank.org/en/publication/human-capital>

National Provident Fund.⁵³ The remaining resources (28 percent) have been allocated towards investments. This includes domestic investments in the public sector (in infrastructure and human capital) and the private sector (for instance directed lending through subsidies to state-owned financial institutions and development finance institutions, such as the BDB). A small fraction was channeled to the BESF for fiscal stabilization purposes (0.2 percent), mainly foreign assets in INR. The Government's current revenue management model is highlighted in Figure 44.

However, to promote economic growth and diversification, Bhutan needs to allocate more of its resource rents towards investments. Currently, Bhutan has one of the highest levels of public capital spending in the world (excluding hydro investments), which has been largely financed by external grants (Figure 43). These grants have covered almost 50 percent of capital spending over the past five years. However, there has been a decrease in external grants, from 14.0 percent of GDP in 2012 to 7.1 percent in 2022. This decline is expected to continue as Bhutan is projected to graduate from the status of Least Developed Country (LDC) by 2023, which is expected to reduce Official Development Assistance (ODA).⁵⁴ Given the current high allocation of domestic resources to public spending, Bhutan has the potential to allocate more of its domestic resources, including resource rents, towards real assets. This would involve directing more funds towards investments in tangible assets such as infrastructure, industries, and other productive sectors.

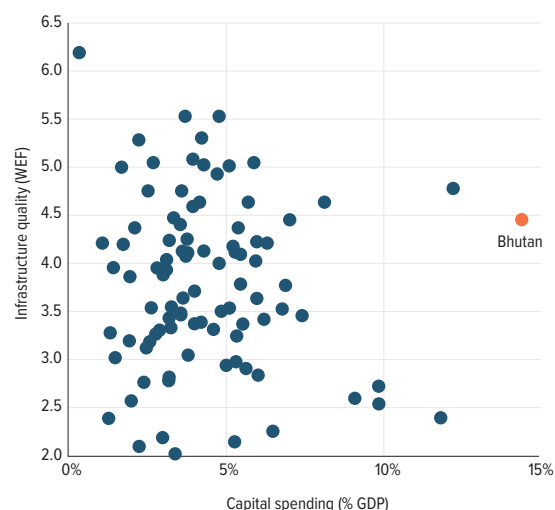
Further, Bhutan has ample scope for improvement in the efficiency of government-funded public investment. Despite having one of the highest levels of public capital spending globally, there are notable investment deficits, particularly in soft and hard infrastructure, and the quality of infrastructure remains below that of many other countries (Figure 44). A Data Envelopment Analysis (DEA) conducted as part of the Bhutan Public Expenditure Review (PER) revealed opportunities for efficiency gains, with an overall efficiency score of 60 for infrastructure. Additionally, a recent diagnostic assessment of the Public Investment Management (PIM) system highlighted several issues in government-funded investment projects, including: a lack of strategic guidance, ambiguity in project appraisal and independent review of project proposals, weaknesses in project selection and review processes, inadequate identification and management of high-risk projects, shortfalls in funding for current expenses and maintenance, and a lack of ex-post evaluation or impact assessments.⁵⁵

Figure 43: Bhutan (non-hydro) capital expenditure in international perspective



Source: Bhutan Public Expenditure Review, 2023.⁵⁶

Figure 44: Public capital Spending versus quality of infrastructure



⁵³ The Bhutan BOOST expenditure database was used to approximate allocation of domestic revenues, of which 40 percent is from hydropower revenues in the form Corporate Income Tax (CIT), royalties, dividends, and profit transfers. Public spending includes wages, goods and services, interest and debt amortization payments, select transfers, and other expenditure. Private spending includes select transfers, including contributions to the provident fund, current grants to individuals and non-profit organizations, and pensions. Investments include capital goods and services, net acquisition of fixed assets, plant and equipment, structures, training, and transfers, equities, and on-lent loans (mainly to SOEs).

⁵⁴ Official Development Assistance (ODA) accounts for approximately 30 percent of total grant receipts. The remainder is received from India and is not expected to be affected by the Least Developed Country (LDC) status. However, grant receipts from India are subject to uncertainty, as they are renegotiated as part of the (Five Year Plan) FYP cycle and are tied to the Royal Government of Bhutan's (RGoB's) ability to execute spending under the FYPs.

⁵⁵ RGoB, Ministry of Finance. 2021. *Strategic Diagnostic Assessment of the Public Investment Management System in Bhutan*.

⁵⁶ World Bank. (2023b). "Bhutan Public Expenditure Review." World Bank, Washington, DC.



To promote economic growth and diversification, Bhutan can consider investing some of the future hydropower rents in the progressive accumulation of productive capabilities in tradable sectors. These investments could help overcome domestic structural constraints such as its small domestic market and mountainous topography, while also mitigating the risks associated with resource revenues, including public investment inefficiency, absorptive capacity constraints, and Dutch Disease-type effects. The principle underlying this course of action is the Hartwick rule that suggests that the value of (net) investment needs equals the value of rents on extracted resources at each point in time.⁵⁷ Bhutan could opt for a two-pronged approach comprising (i) a gradual scaling up of domestic investments in real assets along with the expanding capacity to invest, and (ii) supporting sectors that are affected by Dutch Disease-type effects. In this sense, Bhutan can benefit from a resource management framework that is, in principle, more akin to Malaysia (Box 1).

Going forward, more hydropower resources will need to be set aside to promote fiscal stabilization. As highlighted in the Bhutan PER, Bhutan has one of the most procyclical government spending among its peers, primarily due to the volatility of hydropower revenues. Profit transfers and dividends from SOEs fluctuate from year to year based on factors such as the commissioning of new plants and weather patterns. Therefore, some of the resource rent should be allocated to the BESF to help smoothen volatile hydro revenues and public spending in the face of negative shocks, thereby reducing the need to undertake expenditure cuts with adverse growth development effects (on infrastructure and human capital investment in particular) (Box 2).

1.3.2. Current policies for economic diversification in Bhutan

Bhutan has been actively conducting sector-specific policy interventions to support economic diversification and job generation. These interventions aim to address the unique structural constraints, including being landlocked, having a small labor force, and a limited domestic market. Bhutan has been implementing diversification policies to facilitate the availability of factor inputs, including investments in human capital, infrastructure, physical capital, technological know-how, institutional quality, removal of trade barriers, and access to financing. However, as illustrated in Section 1.2, these policies alone may not be sufficient to stimulate economic diversification. Market failures, specifically information and coordination externalities, can pose significant constraints to the development of specific sectors.⁵⁸ Firms in Bhutan may not fully internalize the productivity gains from potential activities due to information externalities, where they lack knowledge about which products are likely to succeed. Additionally, coordination externalities can hinder the development of new sectors that require specialized intermediate goods, skills, or infrastructure to achieve a critical scale and scope to be viable.

In the case of a small landlocked economy like Bhutan, market failures can be more pronounced due to several reasons. The limited market size and infrastructure constraints contribute to coordination failures, making it challenging for industries to effectively coordinate their activities. The lack of economies of scale further compounds this issue, as firms struggle to achieve cost efficiencies and compete with larger economies. Bhutan's geographical location presents challenges in terms of transportation and logistics, leading to higher costs and limited access to international markets. These constraints can impede the development of industries, hinder scalability, and make it difficult for them to compete globally. Bhutan may also face difficulties in acquiring and adopting advanced technologies due to limited access to knowledge networks and innovation hubs.

The Royal Government of Bhutan (RGoB) uses a wide range of tools to implement targeted sectoral interventions in the product, capital, labor, and land markets with different degrees of complexity. The most prominent example is the State's role as a producer and consumer in the economy, reflected in the large SOE sector. SOEs are concentrated in strategic sectors, including hydropower and electricity, manufacturing, the financial sector, and also industries in which private firms operate, such as, air transport, mining, agriculture, communication, Information Technology [IT], and healthcare. The number of SOEs increased from 18 in 2005 to 39 in 2020, driven by the Government's dual strategy to (i) harness the hydropower potential by developing new hydropower plants and associated services, and (ii) promote economic diversification and job creation through investments in SOEs.

⁵⁷ The Hartwick Rule suggests that countries should invest resource rents into other types of assets, and that a constant level of consumption can be sustained if the value of investment equals the value of rents on extracted resources at each point in time (Hartwick, 1977). See Hartwick, J.M. 1977. "Intergenerational Equity and the Investing of Rents from Exhaustible Resources." *American Economic Review*, 66, 972-74.

⁵⁸ Cherif, R., et al. 2022. "Industrial Policy for Growth and Diversification: A Conceptual Framework." IMF, Washington, D.C.

Box 1: Two contrasting frameworks: resource management in Malaysia and Chile

Active domestic reinvestment of resource rents - the case of Malaysia. Malaysia's resource revenue management practices are oriented towards achieving structural transformation and diversification objectives. During most of the period from 1970-1998, Malaysia's overall fiscal management was characterized by very high fiscal deficits to finance public investments, with transformative effects on the export basket in the long run.⁵⁹ Malaysia's impressive economic performance is closely tied to its sound management of natural resource revenues and that it is one of the few countries that has followed the Hartwick rule, according to which the value of (net) investment needs to equal the value of rents on extracted resources at each point in time.⁶⁰ Malaysia has converted natural wealth into productive capital assets (namely infrastructure, machinery, human capital and institutions) that have supported economic diversification towards manufacturing and services.

Oil and gas revenues in Malaysia have been mostly spent domestically, either through re-investments by Petronas (the national oil corporation), government expenditures, or subsidies.⁶¹ After paying dividends to the Government, Petronas also retains between 25 percent and 50 percent of its oil and gas revenues, which it reinvests in different segments of the oil and gas supply chain, as well as in petroleum-related sectors and non-petroleum-related sectors such as car manufacturing and property development (International Monetary Fund, 2015).⁶² Because of its mandate and significant resource-revenue investments, it can be argued that Petronas has in some instances played a similar role to a resource fund (ibid). It has provided some insulation to the budget against volatility in oil prices, especially in the 1980s, with oil price changes only partially transmitted to the budget (ibid.).

Meanwhile, the share of the revenues allocated through the annual budget is primarily spent on development projects, although there is no exact way to calculate how much oil revenues feed into specific projects because revenues from all industries are "pooled" together.^{63,64} The Federal Government decides how to manage and divide the revenues into three broad areas: expenditure (both recurrent and investments) and savings.

A much smaller portion of oil and gas revenues (about US\$25 million a year) also goes into the National Trust Fund, also called Kumpulan Wang Amanah Negara (KWAN) – set up in 1988 with the purpose of securing national wealth for future generations – in which they are earmarked for future investments and savings.

In addition, while Khazanah Nasional Berhad, unlike Petronas, does not manage resource revenues and receives no 'sovereign' wealth per se, it acts as a strategic investment fund to spur structural transformation and to create strategic value, understood both in terms of commercial profit, as well as potential for knowledge intensity, transformative effects, and spillovers for the national economy.

Over-emphasis on fiscal stabilization at the expense of domestic investment: the case of Chile. Chile's copper-financed sovereign wealth funds do not invest domestically. Since the 1980s, copper windfalls, which have represented around 50 percent of Chile's export revenues in the past decade, have mainly been used for fiscal stabilization and savings for future generations. Chile has indeed implemented a successful counter-cyclical fiscal policy. However, this fiscal stabilization agenda was followed at the expense of financing for structural transformation.

The copper price boom in the 2000s led to an increase in state revenues and allowed the creation of three funds in 2006: the Economic and Social Stability Fund (ESSF), the Pension Reserve Fund (PRF) and the Innovation for Competitiveness Fund (ICF), which is much smaller in size. The ESSF replaced the original Copper Stabilization Fund (created in 1985) and inherited its assets (of around US\$5 billion). Its objective was to finance potential fiscal deficits, therefore avoiding the negative effects on government income associated with copper price volatility. The PRF is a savings fund that receives between 0.2 and 0.5 percent of GDP, depending on the size of Chile's overall surplus each year.⁶⁵ Both the PRF and the ESSF funds are administered by the Central Bank and invested in international markets in low-risk financial instruments (financial assets with a high level of liquidity and low credit risk and volatility), and consequently do not contribute to the local economy through domestic investments.

59 Di John, J. 2009. "From Windfall to Curse? Oil and Industrialization in Venezuela, 1920 to the Present." Penn State University Press, University Park, PA.

60 World Bank. 2013. "Malaysia Economic Monitor: Harnessing Natural Resources". World Bank, Washington, D.C.

61 Lebdioui, A. 2019. "Economic Diversification and Development in Resource-dependent Economies: Lessons from Chile and Malaysia." Apollo - University of Cambridge Repository, Cambridge, UK.

62 IMF. 2015. "Malaysia: Selected Issues". Selected Issues Paper on Malaysia, January 30, IMF, Washington, D.C.

63 Yeoh, T. 2008. "Promoting Revenue Transparency in Malaysia". Centre for Public Policy Studies, London. UK.

64 Centre for Public Policy Studies. 2017. "CPPS Policy Factsheet: Oil and Gas". London. UK.

65 Ruiz-Dana, A. 2007. "Commodity Revenue Management: The Case of Chile's Copper Boom." International Institute for Sustainable Development, Winnipeg, Canada.



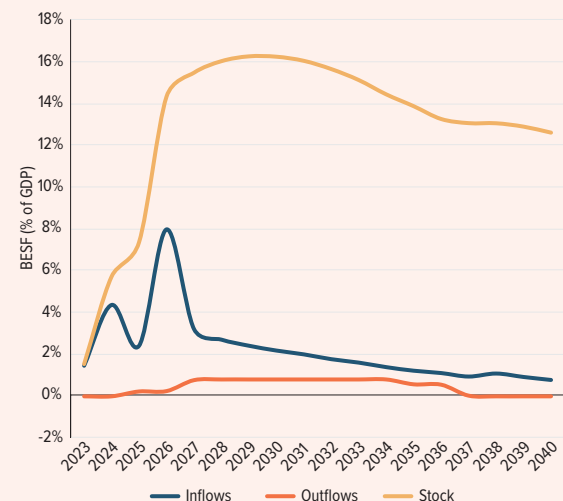
Chile's fiscal stabilization agenda has been successful in smoothing expenditures over time. However, it falls short in effectively supporting local economic development goals. The country's persistent high income inequality is evident, with a peak poverty headcount ratio of 25 percent in the past decade.⁶⁶ The management of copper revenue in Chile reveals the significant opportunity costs associated with excessive investment in stabilization funds at the expense of social spending and investment in productive capabilities.⁶⁷ The current assets of the ESSF, PRF, and copper-funded defense fund represent nearly 10 percent of GDP, while public spending on education, health, pensions, and other social sectors consistently lags behind that of OECD and other Latin American economies.

Box 2: Bhutan Economic Stabilization Fund

The BESF was set-up to stabilize hydro inflows (and other revenue from natural resources) into the Budget, but proceeds have been largely used to finance current expenditures. The Government established the BESF in 2018 as per the Royal

Charter and defined fiscal stabilization rules in 2020 that regulate contributions to and uses of the Fund (mainly covering royalties from hydro and other natural resources and lumpy profit transfers from hydro projects and the Central Bank). Hydropower revenue fluctuates year-to-year depending on the power generated. Hydropower revenue is volatile, as profit transfers and dividends from SOEs fluctuate year-to-year depending on the commissioning of new plants and weather patterns. Over the period 2001-2021, the standard deviation of the real annual value of total hydropower revenues, excluding the newly commissioned Mangdechhu hydropower plant, was 17 percent or 1.9 percent of GDP. On the other hand, current expenditures are structurally more rigid. The Public Finance Act states that current expenditures should be met entirely with domestic resources. This rule does not constrain the growth of current spending when there is a temporary increase in domestic revenues from hydropower. As a result, domestic revenue increases from the hydropower sector have typically been accompanied by increased current expenditures, leading to a procyclical fiscal policy stance. Thus, volatility in hydropower poses fiscal risks as they create moments of fiscal space that allow the expansion of outlays that are not easy to roll back when the cycle is reversed.

Figure 45: The projected balance of BESF in percent of GDP, 2023-2040



Source: MoF Medium-term Macroeconomic Framework (MTMF), World Bank estimates

The BESF could accumulate significant funds if the stabilization measures are operationalized. The Fund held 825 million Nu as of March 2022 or approximately 0.44 percent of GDP. The contribution to the Fund was stopped during the COVID-19 pandemic and withdrawals are not planned from it in the near term. Assuming a resumption of contributions by the Government, the BESF balance would reach about 16 percent of GDP in the medium term (Figure 47). The investment policy stipulates that the assets of the Fund should be invested in relatively liquid foreign assets with low risks (INR and convertible currency) managed by the RMA. While the implementation of the BESF could help achieve a more sustainable fiscal path, it would be important to reconsider the investment policy if the Fund attains a critical size. The BESF rules and regulations specify that once the BESF reaches 10 percent of GDP, additional revenues shall be transferred to a newly created savings fund, which the Government may choose to establish.

66 Lebdioui, A. 2019. "Economic Diversification and Development in Resource-Dependent Economies: Lessons from Chile and Malaysia." Apollo - University of Cambridge Repository, Cambridge, UK.

67 Solimano, A, and Calderon Guajardo, D 2017. "The Copper Sector, Fiscal Rules, and Stabilization Funds in Chile: Scope and Limits." WIDER Working Paper 2017/53. United Nations University – World Institute for Development Economics Research (UNU-WIDER), Helsinki, Finland.

Other sector-specific interventions include marketing boards and strategies, tax incentives, directed and direct lending, skills development programs, and SEZ. The Government has launched several initiatives to promote product quality and complexity and help boost export, for instance “Brand Bhutan”, which supports premium quality and sustainably made agricultural products, manufactured goods, and high value tourism. Further, the Government has been providing fiscal incentives since 2010 in the form of tax holidays and exemptions to promote investment in priority sectors, including agriculture, tourism, and energy. Capital market interventions include the Priority Sector Lending (PSL) program,⁶⁸ the National Credit Guarantee Scheme (NCGS), and two national development banks, and the BDB, mainly promoting access to finance for the agriculture and CSI sector (see Chapter 3). Additionally, Bhutan has a wide range of skills development and employment promotion services to address shortages of skills. Finally, Bhutan has established several SEZs to spur industrialization, exports, youth employment opportunities, and Foreign Direct Investment (FDI).

These policies have yielded mixed results, with limited impact on job creation. While SOEs contribute to a significant part of economic activities and budget revenues – primarily driven by the electricity sector – the profitability of SOEs across sectors has exhibited mixed and volatile performance. The profitability of SOEs is lower in competitive sectors (manufacturing, retail, construction, and transport) compared to non-competitive sectors, which could reflect conflicting objectives and a lack of competition (World Bank, 2023b). Fiscal incentives have benefitted mostly medium and large businesses in the manufacturing, financial, and tourism sectors (World Bank, 2023b). Credit to the agriculture and CSI sector has remained stagnant, and access to credit remains a key constraint to private sector development (see Chapter 3). Finally, a recent World Bank firm-level survey suggests that firms inside Bhutanese SEZs tend to have significantly larger exports and employment than those outside these zones. However, there are no significant positive impacts on FDI (Box 5).

Sector-specific policies have been implemented in many countries as part of their growth strategies, but many have been ineffective and inefficient. Governance failures, including state capture by rent-seeking private interests and short-term electoral considerations, can result in suboptimal outcomes. This can result in disappointing returns in terms of growth, job creation, and high financial, environmental, and social costs and, in the worst case, hinder growth and destabilize economies and societies. **The following principles can mitigate these risks:**⁶⁹

- ▶ **Establish strong institutional mechanisms that incentivize beneficiaries to engage in market competition, with clear performance criteria for selective interventions.** The implementation of governance mechanisms, transparency, and public disclosure can help enhance spending efficiency of resource rents and promote effective allocation of resources. Appropriate benchmarks for the support received can be set up (i.e., specific performance targets such as export market shares).
- ▶ **Focus on export orientation (rather than import-substitution) to leverage international competition, and target sectors rather than specific firms.** Countries that implement successful sectoral interventions rely on market signals to hold themselves accountable, sustain competitive pressures, and drive innovation in the development and export of new products. In contrast, import-substitution policies through high tariffs and other barriers to entry can limit competition in the domestic market and the incentive to innovate, export and compete in international markets.
- ▶ **Using independent, appropriately qualified experts to select projects for public support.** Since there are financing constraints as well as constraints in implementation capacity, investments must be carefully analyzed to determine their feasibility and rate of return. Balancing social, political, and economic considerations in investment evaluation is complex. Therefore, it is crucial to set up the necessary institutions to evaluate potential investments and loans, in addition to the essential transparency and oversight that yields effective governance of development finance institutions.

The next section lays out institutional options to improve sector-specific policy interventions in Bhutan, focusing on public finance institutions, evaluation and reporting arrangements, and coordination with education and territorial policies.

68 The RMA prescribes lending targets for the banks, and ceiling preferential lending rates for lending to the agricultural and non-agricultural CSI sectors. Financial institutions which have any shortfalls in meeting their priority sector targets may allocate their funds for on-lending to a microfinance institution or BDB.

69 Cherif, R. & Hasanov, F. 2019. “The Return of the Policy That Shall Not Be Named: Principles of Industrial Policy.” IMF, Washington, DC. and Cherif, R. et al. 2022. “Industrial Policy for Growth and Diversification: A Conceptual Framework.” IMF, Washington, DC.



Box 3: Institutional options

Fiscal stabilization funds can provide a fiscal buffer in case of a shock, reduce exchange rate volatility, and help mitigate the Dutch Disease. Sovereign Development Funds and NDBs can encourage national development by providing financing and investing in domestic infrastructure and local enterprises with growth potential. In principle, an SDF makes equity investments in companies, while NDBs provide loans, but in practice, some SDFs also make loans and some NDBs take equity positions, and the difference between the two can be indistinct.

National Development Banks and SDFs can issue bonds to draw on private capital (which also contributes to growing domestic financial markets) and establish partnerships with foreign firms and investors. Sovereign Development Funds might also be able to attract investment from larger global Sovereign Wealth Funds (SWFs), including those of the Gulf nations and Singapore's Temasek, which have large international investment portfolios. Sovereign Development Funds can assist in privatization programs if government shares in SOEs are put into the fund, with the goal of attracting private investment to help reform them and turn the former SOEs into profitable commercial enterprises. Finally, NDBs and SDFs can also extend loans to enterprises during downturns and ease back during booms (to reduce over-heating), thereby acting as counter-cyclical instruments.

Figure 46: Institution types, objectives, and asset types

Type of institution	Objectives	Asset types	Examples
Stabilisation Fund	- Provide a fiscal buffer in the case of a shock, to avoid increasing debt, or at least cushion the impact - Dampen the exchange rate volatility associated with shocks - Aims to prevent the 'resource curse' and the Dutch disease more specifically	Liquid & low yielding (e.g. sovereign bonds)	
National Development Banks	- Encourage national development by providing financing for domestic infrastructure and firms - Can draw on private capital by issuing bonds, and partner with foreign investors. - Helps overcome market failures preventing investments in productive activities - NDBs face more scrutiny than SDFs as the former have commercial credit ratings if they issue bonds	Illiquid & low yielding (e.g. loans or equity positions)	
Development Fund	- Encourage national development by investing in domestic infrastructure & equity of companies with growth potential - Transfer and manage 'privatised' assets - Invest in equity abroad to foster technology transfer and JVs with domestic partners	Relatively illiquid (e.g. equity in unlisted start-ups)	

Source: Lebdioui et. al. (2023). CEM Background Paper.

1.3.3. A suitable institutional framework for effectively channeling hydropower rents towards productivity enhancing assets in Bhutan.⁷⁰

Public development institutions – building one well-managed and well-regulated institution is preferable to having multiple weak ones.

Public development finance institutions play a crucial role in attracting private and foreign investments, but their effectiveness depends on having adequate managerial and regulatory capacity. Box 3 provides an overview of the different types of development finance institutions, their objectives, and the types of assets they manage. Fiscal stabilization funds can serve as a buffer during economic shocks, reduce exchange rate volatility, and help mitigate the Dutch Disease-type effects. Sovereign Development Funds (SDFs) and National Development Banks (NDBs) can contribute to national development by providing financing and investing in domestic infrastructure and local enterprises with growth potential. However, the mere establishment of NDBs and SDFs is not enough to ensure the proper management of

⁷⁰ Based on Lebdioui, A., et al. 2023. CEM Background Paper. World Bank, Washington, D.C.

Box 4: From a Government Holding Company to a Sovereign Development Fund: The Case of Malaysia's Khazanah Nasional Berhad

Khazanah Nasional Berhad ("Khazanah") was incorporated in 1994 as the strategic investment arm of the Government of Malaysia. This was initially to house the Government's shareholding in industries deemed strategic to the nation, such as in the provision of electric utility, telecommunications and airports services that had been corporatized from government departments into public companies. Its initial objective was to manage and turn around those SOEs that were underperforming but overtime also transitioned to an SDF and a Sovereign Venture Fund.

For the first ten years, Khazanah's investment style was principally custodial and passive, with more than 90 percent of the value of assets under management being in Malaysia. In the aftermath of the Asian Financial Crisis of 1997/1998, several other companies deemed strategic to the nation were added, including in airlines, infrastructure, banking, and telecommunications. In 2004, a radical change in strategy was undertaken as Khazanah was mandated with the multiple tasks of: (i) uplifting the erstwhile poor performance of what became known as Government-Linked Companies (GLCs, essentially SOEs wholly or partially owned or guaranteed by the Government); (ii) to restructure companies and industries affected by the Asian Financial Crisis; (iii) to expand the investment footprint into new sectors and geographies; and (iv) to build human capital and talent in the area of investment, corporate management and development management for the state-owned sector and the nation at large. In order to undertake this significant shift in its mandate, several key measures were undertaken. These included (i) changing its investment style to become significantly more active and hands-on; (ii) revamping the management team and board (civil servants were replaced with leading talent from the relevant fields, including from asset management, investment banking, and strategy consulting); and (iii) upgrading and strengthening its core systems, including risk management, investment evaluation and execution, operational management, human capital management, and strategy.

From 2004-2018, Khazanah's portfolio grew to Malaysian Ringgit (MYR) 157 billion (US\$40 billion), while net assets rose significantly from MYR 33.3 billion (US\$ 8.5 billion) to MYR 115.6 billion (US\$ 29.5 billion), an increase of 3.5 times. This translated into a compounded annual growth rate of approximately 9.6 percent per annum over this period, which was significantly higher compared to many of its peers. These improvements in financial performance were achieved with essentially no new equity capital injections from the Government and with risk tolerance set at appropriately prudent levels. Equally importantly, Khazanah also pioneered an investment style that has been described as not just executing a Sovereign Wealth Fund (SWF) investment strategy, but also achieving developmental outcomes in delivering strategic outcomes. These include investing in and driving industrial policy (in industries including healthcare, life sciences and biotechnology, sustainable development, creative industries among others), developing new SEZs (a US\$100 billion, Iskandar Malaysia), significantly restructuring GLCs under a 10-year GLC Transformation Program (2005 to 2015), and expanding its regional and international investment footprint.

Today, Khazanah, remains a key national institution in delivering financial, economic, and socio-developmental outcomes for Malaysia. In various studies analysing its performance, the key drivers for success have been identified under three categories—(i) a clear and empowered mandate; (ii) critical capacity in key enablers, including the right talent, management systems, and program management capabilities; and (iii) sound execution and consequence management systems.

hydropower revenues. There are many examples of resource revenues wasted through ill-conceived investments; NDBs and SDFs can be subject to political capture, increasing the risk of investments being directed away from projects that benefit national development.

Given the importance of effectively allocating resources, concentrating resources on a select few institutions and initiatives can be beneficial. Bhutan already has several development institutions, including BDB, DHI, BoB, and the BESF. The state-owned National CSI Development Bank Limited was merged with the BDB in 2023 due to financial losses and overlapping mandates. Drawing from international experiences, one option to channel hydropower revenues into domestic investments for export diversification could involve expanding the mandate of DHI from a holding company to an SDF, similar to the model of Khazanah in Malaysia (Box 4). Other alternatives include expanding the mandate of the BoB, increasing the capacity of the BDB, or re-orienting the BESF into an SDF.



Setting up a public Investment Evaluation Unit for efficient evaluation and monitoring

The establishment of an autonomous and technically equipped public Investment Evaluation Unit (IEU) is crucial to supporting the development of strong analytical capacity to evaluate development projects and policies. An IEU comprises well-qualified economists and other specialists who evaluate projects and policy reforms in all their dimensions: costs and benefits, economic rates of return, risk assessment, financing, and environmental and community impacts. Ideally, an IEU is independent and maintains a long-term vision of economic transformation, irrespective of the macroeconomic cycle. An IEU has a broader mandate than a PIM unit within the central government, which is tasked with aiding government agencies in the preparation of investment projects. In addition to strengthening investment project decisions, setting up an IEU can also send a strong market signal to potential investors regarding the quality of economic management. A strong IEU has the following characteristics:

- ▶ **Technical integrity and independence**, with some degrees of autonomy from day-to-day political influence; a commitment from other government branches to provide information and data and avoid ‘lobbying’.
- ▶ **A pool of well-trained professionals** with analytical capacity to assess investment projects, including environmental and community impacts (human development, poverty, and social inequality effects). Experience can be drawn from outside government and foreign expertise when required.

Efficient evaluation and monitoring require transparent reporting. Transparency can be enforced in multiple ways, both ex-ante (about how decisions get authorized) and ex-post (evaluation). In addition, monitoring and evaluation mechanisms can derive from top-down authority, bottom-up pressure from citizens and their representatives, civil society groups, as well as norms internalized by the public sector workforce.⁷¹ Sovereign Wealth Funds that are permitted or mandated to invest domestically should issue publicly available reports on a timely basis, covering their activities, assets, and returns, as well as allowing themselves to be audited both internally and externally.⁷² While all funds embody “vertical accountability” (reporting to the government), some also mandate “horizontal accountability” to a wider audience, by making information on balances, earnings, and deposits and withdrawals publicly available, or by sharing decision-making power among a range of interest groups independent of the government.⁷³ A good example is Norway’s wealth fund, which is administered by the Central Bank, but decisions on transfers must be approved by Parliament.

The altitude economy – an approach to balance ambitions with risks and identify sectors

Bhutan’s sector-specific support policies could be formulated around the concept of the altitude economy, which balances ambitions with risks. The principle of the altitude economy identifies different ‘elevations’ with the aim of ascending to higher levels over time. Some policies and projects are readily attainable with current financial and human resources and have good returns with few risks — the ‘foothills’. A more ambitious policy effort beyond the foothills requires more resources and preparation to mitigate the risks. ‘Mountains’ are initiatives with potentially high rewards for economic development but significant financial and environmental risks. ‘Peaks’ could be transformative in achieving a much higher growth path, quality job creation and increased government revenue, but the risks can be the highest and must be carefully weighed alongside the rewards. The principle of the altitude economy is illustrated below, using examples from Bhutan’s current policy measures and select policies proposed in the draft 13th Five Year Plan (FYP):

1. **Foothills – relatively attainable rewards with low risks:** Such policies or projects have high rewards, low costs, and low risks. They are readily achievable without too much effort or cost and policymakers can be almost certain of success. Examples in Bhutan include strategic branding such as ‘Made in Bhutan’ or ‘Bhutan Believe’, export promotion agencies to match buyers with suppliers, and skill development programs to address skills mismatches.

⁷¹ Collier, P., et al. 2010. “Managing Resource Revenues in Developing Economies.” *IMF Staff Papers*, 51(7): 84-118, IMF, Washington, D.C.

⁷² Gelb, A., Tordo, S. and Halland, H. 2014a. “Sovereign Wealth Funds and Domestic Investment in Resource-Rich Countries: Love Me or Love Me Not?” *Economic Premise, Poverty Reduction and Economic Management Network (PREM)*, World Bank, 133, 1-5.

⁷³ Gelb, A. and Grasmann, S. 2009. “Déjouer la malédiction pétrolière”, *Afrique Contemporaine*, 229 (1), 87-135..

2. **Mountains – high potential rewards and high risks:** Such initiatives can be realistically developed with relatively modest financial commitment but are costlier to achieve and carry greater risks compared to foothills. The Government's capital market interventions, including direct and directed lending to the agriculture and CSI sector could be considered mountains. While interventions like the NCGS and the National CSI Development Bank (NCSI) offering government guarantees and subsidized microloans can enhance credit accessibility for respective firms, stimulate production, and boost employment, they can also pose risks to financial sector profitability and entail fiscal costs and contingent liabilities. For instance, the NCSI had to be recapitalized and subsequently merged with BDB in 2023 due to high NPLs.
3. **Peaks – potentially transformative but with the most significant risks:** These policies or projects offer considerable rewards and may be transformative in achieving higher growth and government revenue, and quality job creation. Yet, the risks can also be high and must be carefully weighed alongside the rewards. They may lock up very large amounts of finance, thereby risking public finances if the returns are disappointing. Such projects may also carry environmental risks, resulting in damage to natural capital, which could be irreversible if not well-identified and managed. An example of a peak initiative is the government's strategic involvement in the hydropower sector, which involves large fixed-capital investments and a long-term horizon.⁷⁴ While the sector has significantly contributed to economic growth, government revenues, and exports, it is important to consider environmental, technical, and financial risks associated with such projects.

The Gelephu Mindfulness City (MC) initiative could be considered another peak as it represents a significant and transformative investment with the potential for substantial impact, yet it carries considerable risks. Gelephu is a town in Sarpang district, about 30 km from the southern border with India. It is envisaged that the new megacity project will be a Special Administration Region (SAR) of 1000+ km², with legal autonomy. The project is envisaged with, *inter alia*, the following features: construction with the help of foreign capital and expertise; development of a green city; incorporation of research and energy efficient data centers for expanded data hosting capacity and with a vision to serve as a hub for digital innovations including emerging technologies such as blockchain and artificial intelligence; and provision of world-class infrastructure and amenities.

The Gelephu MC is envisioned to be one-of-a-kind, anchored in the values of GNH and grounded on the Bhutanese identity. Businesses will operate only on invitation to ensure alignment with this vision. Like other economic hubs, the goal will be to stimulate economic growth by developing new industries, host an international airport to serve as a gateway to South Asia, boost trade, create employment to arrest outmigration and encourage the return of the Bhutanese diaspora. The SAR is not expected to be densely populated, and farmlands and forest coverage will be retained.

The ambitious vision will require significant investments, including from the private sector, in energy, digital connectivity, and infrastructure. Given its location, Gelephu has potential to be developed as a freight consolidation center and trade gateway, with multimodal transport links. Significant FDI and expertise will be required to fulfill this vision. FDI is expected to bring opportunities, particularly for the youth, increase access to technology and innovation; an attempt to address the outmigration challenges facing the country.

Economic zones are often a “high-risk, high reward” endeavor with mixed results. Global experiences offer lessons and good practices that could be considered for the Gelephu SAR. Box 5 lists good practices and examples from SEZ experiences globally and in Bhutan. The proposed SAR includes interesting features, including a focus on blockchain technologies, research and data centers, and environmental compliance. Therefore, global lessons from smart city projects, highlighted below, are relevant as well:

1. **Leveraging benefits of agglomeration economies:** World Bank analytical work on Regional Development and Economic Transformation in Bhutan has highlighted that settlements with locational advantages and nascent economic clusters like Gelephu should focus on improving the conditions for private investment in emerging sectors such as agribusiness, agro-processing and manufacture and scaling up SMEs and cottage industries by

74 As of FY21/22, the project cost (loan component) of Puna I, Puna II, and Mangdechhu hydropower projects represents approximately 25 to 30 percent of GDP.



improving connectivity.⁷⁵ Connectivity has both physical and policy dimensions. This could include addressing demand-side obstacles, including limited access to finance, constrained linkages in product value chains, and impeded spillover of knowledge, skills, and technology. Cities like Gelephu also need to boost capacity in urban planning and land administration as well as strengthen infrastructure, service delivery and ICT connectivity to catalyze growth. Instead of an “enclave” approach centered on Gelephu, a “corridor” approach that connects Gelephu to other urban centers (such as Thimphu and Paro) and their hinterlands, as well as to the regional Indian market, can help harness agglomeration economies and benefit lagging regions.

2. **Ensuring strategic planning:** This, based on rigorous market demand assessment, will be the key to determine the extent of private sector (especially overseas) interest and participation. Once demand is ascertained, a detailed economic feasibility analysis should be undertaken to target the type of businesses that can be invited. A purely supply-driven approach can be problematic. It is also important to adopt a long-term planning mindset, as there can often be political pressure to achieve quick-win results.
3. **Efforts to maximize potential positive spillovers:** The SAR could aim to boost quality jobs (direct and indirect), investment, exports, and support the inclusion and sustainability agendas. To accomplish these goals, spillover effects such as technology transfer, skills upgrading, backward and forward linkages, and productivity enhancement must be kept in mind.
4. **Implementing a robust policy, institutional, and legal framework:** Success would require timely and meaningful policy, regulatory, and legal reforms to address critical market failures (such as infrastructure and connectivity) and government failures (such as effective coordination and implementation). This would require willingness as well as the capacity of the relevant authorities to undertake such reforms. Many economic hubs have failed as they were disrupted by political interference, corruption, and lack of transparency. Regulatory ring-fencing to address these will contain risks and promote agility in planning and management. Clarity on roles and responsibilities as well as a transparent and predictable legal, institutional, and policy framework will provide certainty for investors. Since developing an economic zone is an expensive undertaking, many end up as “white elephants” without sufficient planning, capacity, and management.
5. **Clarity on modality, financing, and risk mitigation:** Further clarity is required on the business model and modality of the zone and on whether it will be developed by the government, or through public-private partnerships (PPPs), or by private investors (private capital, bank lending, capital markets). The role of the government will be critical (including, implementation of a regulatory framework, provision of land and public services), modes of financing (general government budget, domestic or external debt issuance) and fiscal risks management. Risks and mitigation measures need to be properly identified.

The models of zones have evolved over time (Table 5). Fourth generation zones focus on higher value-added service sectors (such as finance and trade service) and are more business-friendly in terms of laws and regulations. A successful example is the Shanghai Pilot Free Trade Zone (FTZ) launched in 2013. In 2017, Malaysia launched the world’s first Digital Free Trade Zone to facilitate the entry of SMEs into the e-commerce market via a conducive business environment. Fifth generation zones are centered around emerging digital technologies and strong integration with urban development. An example is the NEOM giga-city under construction in Saudi Arabia.⁷⁶

Gelephu could aspire to be a fifth generation economic zone For instance, it could aim to become a regional data and innovation hub by attracting private investments in green data centers.⁷⁷ Enabling cloud computing technology and services in these centers could help Gelephu position itself as an innovation hub by offering, as-a-service, emerging technologies such as artificial intelligence (AI), distributed ledger technology, and blockchain, to leap-frog digital solutions. Blockchain can also help track and validate carbon emissions and environmental impacts of the data center.⁷⁸

⁷⁵ World Bank. Bhutan Urban Policy Notes: Regional Development and Economic Transformation, World Bank, 2019 (<https://elibrary.worldbank.org/doi/epdf/10.1596/31816>).

⁷⁶ *The Past, Present, and Future of Special Economic Zones and Their Impact*. Douglas Zeng. World Bank; Journal of International Economic Law (2021).

⁷⁷ The “Green Data Center Strategy” (2017) concluded that Bhutan’s cold climate, negative carbon footprint, and low cost of electricity makes it an ideal location to attract investments in green data centers.

⁷⁸ *Green Data Centers: Towards a Sustainable Digital Transformation. A Practitioner’s Guide*. World Bank and ITU (2023).

Another possibility is to provide services as a *disaster recovery data center* for non-critical data/systems for neighboring countries such as India. However, gaps remain, for instance, high price and low reliability of high-speed internet, lack of human capital, policy and regulatory gaps that might not be conducive to FDI facilitation, and weak digital safeguards to protect data and systems from the rapidly evolving risks such as cyber-attacks and data leaks. If not addressed, these risks can lead to low investor confidence.

Table 5: Evolution of Economic Zones

Zone type	Generation	Characteristics
Export Processing Zone	First	Focusing on FDI and exports; little linkage to local economy.
Multi-functional SEZ	Second	Larger, multisectoral, multifunctional; better linkage to local economy.
Eco-Industrial Parks	Third	Emphasizing both economic competitiveness and environmental sustainability, with an integrated approach.
Modern Free Trade Zone	Fourth	Focusing on high value-added modern service sectors and more business-friendly reforms.
Intelligent City	Fifth	Also called 'digital zone' or 'smart city', where digital technologies are embedded in production and services, and industrial and business activities are fully integrated with urban and eco-development concepts.

Source: World Bank; Journal of International Economic Law (2021).

To achieve economic diversification, Bhutan can focus on high value-added and tradable low carbon activities, particularly in the services sector, while taking advantage of the country's track record in ecological preservation and commitment to sustainable development. Some examples of foothills, which are relatively easy to implement, include international payments for ecological services and eco-tourism (see Box 6). These activities have low complexity but can still generate economic benefits. More complex activities like value-added agriculture offer higher development returns and knowledge spillovers. There are also high peaks, such as value-added IT services and biodiversity-based innovation, which have a potential for significant returns. These sectors can be prioritized to create a virtuous circle of sustainable diversification. For instance, ecotourism, especially in the emerging high-tech retreat industry, can be linked with the local start-up and IT services sector to foster economic growth. However, these activities would require improvements in basic capabilities, including country-wide high-speed internet access, access to clean and reliable electricity, as well as the development of necessary infrastructure. While selecting sectors and activities, the following indicative criteria can be considered:

- ▶ **Proximity to existing productive structures:** How easy would it be to repurpose existing capabilities for this new activity?
- ▶ **Global technology trends:** How could innovations cause disruptions to some activities and related supply chains but also open up opportunities for others?
- ▶ **Regional market demand:** What are the goods neighboring countries import, which Bhutan could export competitively?
- ▶ **Degree of market competition regionally and globally:** Even if there is demand for a product, are there other nations that can meet this demand more competitively than Bhutan?
- ▶ **Conformity with Bhutan's geographic conditions and trade costs**
- ▶ **Potential for value addition and job creation:** Are those activities sufficiently labor intensive to reduce unemployment in Bhutan, in particular for youth and women?
- ▶ **Alignment with Bhutan's ecological sustainability agenda:** Do these activities cause ecological damage that is incompatible with Bhutan's environmental agenda?

Box 5: Special economic zones – global results and recent evidence from Bhutan

SEZ have been used by many developing countries as a policy tool to promote industrialization and economic transformation, but global results of SEZ in developing countries have been mixed. A SEZ is supposed to complement market forces by helping to overcome market and policy failures such as malfunctioning land market, deficient industrial infrastructures, or a poor business environment. Results from SEZ vary significantly; some regions or countries (especially in East Asia) are generally more successful while others (especially in Sub-Saharan Africa) struggle to make zones work.⁷⁹ Even in the same country, it is normal to have both successful and failed zones. SEZ “poster children” countries include Korea, Malaysia, China, Mauritius, and UAE (Jebel Ali). There are also examples of “white elephants” as well, for instance in Nigeria, several zones in India, and even a few in China.

Bhutan has established an economic zone program in 2010 and an economic zones policy (“Business Infrastructure Policy”) in 2018. Bhutan has six industrial parks, including five in the South (Pasakha, Bondeyma, Dhamdum, Jigmeling, and Motanga), and one near Thimphu (Bjemina). In addition, Thimphu TechPark was established in 2012. A recent World Bank report assessed the performance of economic zones within the Bangladesh, Bhutan, Nepal, and India’s Eastern Economic Corridor (EEC) by interviewing 122 Bhutanese firms (60 inside the zones and 62 outside zones) in three industrial parks: Motanga, Bjemina, and Pasakha. The results are as follows:

- ▶ Bhutanese firms inside zones perform reasonably well relative regional peers. On employment generation, exports, and FDI, they outperform India and Nepal, but fall short of Bangladesh.
- ▶ Firms inside zones tend to have significantly larger exports and employment than those outside zones. However, there are no significant positive impacts on FDI.

Expanding zone programs could seem a promising direction for policies aimed at promoting greater exports and job creation. Among the lessons learnt for the successful implementation of SEZ include having a strategic location; integrating the zone strategy with the overall development strategy; (ii) increasing the market contestability through a rigorous market demand assessment focusing on comparative advantages and private sector participation und; (iii) and ensuring that zones are “special” in terms of piloting reforms for a business-friendly environment and are resilient to various external shocks. The lessons can be broadly classified into four do’s and four don’ts (see **Table 6**).

Table 6: The four do’s and four don’ts of SEZs

DOS	DON'TS
1. Choose the right location	1. Lack of strategic planning and demand-driven approach
2. Foster a conducive business environment with a reform-oriented mindset (use SEZs to pilot policy reforms)	2. Fail to address the critical market and government failures (such as infrastructure and government coordination)
3. Increase the market contestability through a rigorous market demand assessment and private sector participation	3. Poor policy and legal environment and weak implementation capacity
4. Maximize the positive spillovers through an inclusive and sustainable approach	4. Inability to mitigate the environmental and social risks

Source: Bangladesh, Bhutan, India, and Nepal: How can economic zones contribute to the 200 million job challenge⁸⁰; World Development Report. Trading for Development in the Age of Global Value Chains⁸¹; The Dos and Don’ts of Special Economic Zones.⁸²

79 World Bank. 2019. “World Development Report 2020: Trading for Development in the Age of Global Value Chains.” WB, Washington, DC.

80 WB. 2022. “Bangladesh, Bhutan, India, and Nepal: How can economic zones contribute to the 200 million job challenge.” WB, Washington, DC.

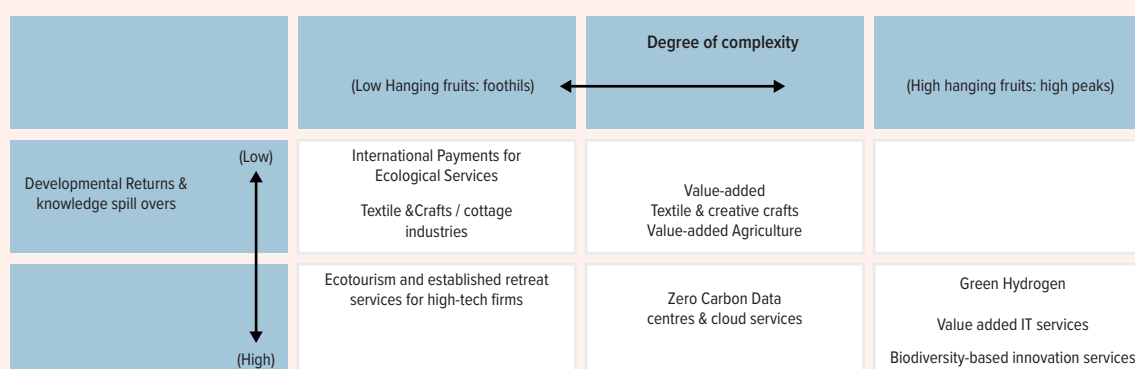
81 WB. 2020. “World Development Report: Trading for Development in the Age of Global Value Chains.” WB, Washington, DC.

82 WB. 2021. “The Dos and Don’ts of Special Economic Zones.” WB, Washington, DC.

Box 6: Mapping of potential sectors and activities

- **International payments for ecological services: a valuable foothill.** Biodiversity and natural ecosystems are among the country's most valuable assets, and policy efforts exist to marketize and compensate for the protection of such assets. Given that Bhutan is one of the first carbon negative countries in the world, monetizing ecosystem services and engaging in carbon emissions trading could represent a low hanging fruit as part of Bhutan's diversification strategy. To achieve this objective, Bhutan would need to engage in international carbon trading systems and develop bilateral frameworks with other countries or firms, aiming to offset their carbon emissions. Such objective will require considerable diplomatic action and international negotiations. The revenues from such trade could help finance a domestic Payment for Ecosystem Services (PES) program, which would enable the Government to remunerate communities involved in conservation across the country.⁸³
- **High value tradable services; another foothill.** High value tradable services constitute a promising area for productive diversification as they can circumvent the high trade costs associated with traditional merchandise exports. However, improving the provision of basic capabilities (especially universal, country-wide high-speed internet access, and access to clean, reliable and affordable electricity) will be important to attract investment in energy intensive services (i.e., low carbon data centers).
- **Hydrogen: a peak - opportunities but also important challenges.** Given Bhutan's ambitious increases in installed hydropower capacity, Bhutan is exploring the use of excess hydropower generation for green hydrogen production (a roadmap was expected to be completed by end-2023).⁸⁴ However, careful analysis is needed to avoid potential bad investments. Green hydrogen production costs are still high and may not align with Bhutan's long-term development strategies. Additionally, using green hydrogen for electricity generation has high conversion and storage losses. In the transport sector, hydrogen-powered mobility may be too expensive or better substituted with electro-mobility.⁸⁵ Investing in green hydrogen requires a well-coordinated strategy that considers opportunity costs and infrastructure needs. Export potential to India should also be assessed, considering India's own green hydrogen strategies.

Figure 47: Mapping of potential sectors and activities on a complexity/returns matrix



Source: Lebdioui et. al. (2023). CEM Background Paper.

Note: The mapping of potential sectors and activities serves as an illustration. More in-depth analysis would be required to explore and validate potential sectors and activities, including consultations with sector experts.

⁸³ PES, which were pioneered in Costa Rica, are financial mechanisms whereby landowners receive direct payments for the ecological services that their lands produce when they adopt environmentally friendly land uses and forest management techniques (Malavasi, E.O. and Kellenberg, J. 2002). Such mechanisms to marketize the value of ecosystem services provided by local communities have often been limited to national boundaries and local communities often struggle to receive remuneration from the international community for this 'tradable' service (Lebdioui, 2022), which is why linking this agenda with an international carbon trading system is key to ensure its financial sustainability in the long term. A project such as this would represent a foothill in the sense that it requires relatively low financial investments, while creating jobs and providing revenues in remote rural areas without compromising Bhutan's ecological agenda. See Malavasi, E.O. & Kellenberg, J., 2002. "Program of Payments for Ecological Services in Costa Rica." In Building Assets for People and Nature: International Expert Meeting on Forest Landscape Restoration, 27, 1-7. Heredia, Costa Rica and Lebdioui, A. 2022. "Inequality and Trade Diversification: How can Income Inequality in Latin America be Reduced Beyond Commodity Booms?" Canning House, LSE, London, UK.

⁸⁴ End-use possibilities may include decarbonizing various sectors (e.g., industry, transportation), using hydrogen to generate electricity in periods of low hydro production or exporting hydrogen products (e.g., ammonia) to neighboring countries.

⁸⁵ Not only for passenger vehicles, but also two- and three-wheelers, public transportation, and long-haul trucks. While there are significant infrastructural requirements, the technologies in general are further developed with promise of further cost reductions due to economies of scale and well-funded technological innovation.



Box 7: Costa Rica's experience attracting FDI in green activities and impact on inequality

Costa Rica is often cited as an example of successful diversification from commodities to knowledge-intensive electronics and medical goods exports. In the 1980s, Costa Rica abandoned a development model based on import substitution industrialization and started implementing new policies to foster export diversification. Such policies included the creation of Export Processing Zones (EPZs) to attract FDI in high value-added and high-tech sectors, introduction of export tax reduction, and government subsidies. Such policies were largely successful, as Costa Rica's exports experienced high and almost uninterrupted growth from the mid-1980s to 2020 (with the exceptions of the 2009 financial crisis and the COVID-19 crisis in 2020).

Costa Rica's well designed public policies to support diversification enabled the country to benefit from major investments in the industrial sector, including Intel's investment in a microprocessor plant in 1997, which remains one of the largest FDIs in Costa Rica's history. This investment has been important to Costa Rica, as it helped reverse the drop in Costa Rica's terms of trade due to low world prices of its most traditional exports and was responsible for a surplus in Costa Rica's trade balance.^{86,87} Costa Rica went from being highly reliant on commodity exports to having booming high-tech and medical equipment manufacturing exporting industries. By 2000, computer parts alone accounted for almost 40 percent of total value of the country's exports. In 2019, Costa Rica's largest exports were medical Instruments and appliances (around US\$4 billion, which represents almost one-third of Costa Rica's exports).

Additionally, Intel's investment had a subsequent "signaling" effect on other potential investors, and the country's export promotion agency, CINDE, used this "stamp of approval" to launch an aggressive campaign to attract other electronic manufacturers (ibid). In more recent years, Costa Rica's export promotion has also successfully leveraged the country's natural capital to attract new types of investments in decarbonized services and activities. Benefiting from an electricity matrix that is 99 percent reliant on renewable energies, Costa Rica has become a world leader in attracting eco-conscious foreign investors.

However, it is worth highlighting that while diversification was accompanied by a high growth rate, reduction in poverty, and large social investments in public health care and education, income inequality has persisted.⁸⁸ This has notably been the result of the increasing wage premium for skilled workers, whereas unskilled workers have not been able to benefit as much from the emerging high-tech manufacturing sectors. Another issue is that Costa Rica's industrial clusters are mostly located in the center of the country, while people living in coastal areas remain dependent on commodities and tourism as a means of livelihood. The dynamics of rebalancing regional growth and promoting a more socially inclusive diversification model by ensuring that workers excluded from the labor market also benefit from employment opportunities arising out of new industries, therefore, remain key considerations in Costa Rica and ones that bear high relevance in Bhutan's context.

Coordination between diversification, education, and territorial policies

Coordination between diversification, educational and territorial policies is crucial to ensure that job creation from economic diversification does not increase inequality or result in spatial misalignments. Sector-specific policies may increase inequality if they focus exclusively on sophisticated sectors that only create better jobs for a few high-skilled people (see example of Costa Rica in Box 7). Additionally, there is a risk of spatial misalignments if new job opportunities arise in communities or regions that do not have high unemployment rates. This can lead to disparities and uneven development across different areas. Ensuring that low-income groups can benefit not only from unskilled employment

⁸⁶ World Bank. 2006. "The Impact of Intel in Costa Rica: Nine Years After the Investment." World Bank, Washington, D.C.

⁸⁷ Ferreira, G.F.C., Fuentes, P.A.G., and Ferreira, J.P.C. 2018. "The Successes and Shortcoming of Costa Rica Exports Diversification Policies." Background Paper to the UNCTAD-FAO Commodities and Development Report. 2017. FAO, Rome, Italy.

⁸⁸ Lebdioui, A. 2022. "Inequality and Trade Diversification: How can Income Inequality in Latin America be Reduced Beyond Commodity Booms?" Canning House, LSE, London, UK.

opportunities in labor intensive sectors but also from the skilled employment opportunities that arise from Bhutan's diversification towards value-added sophisticated sectors, emphasizes the importance of coordinating industrial and education policy.

Special incentives and investments can target high-unemployment areas to allow for regional rebalancing. If hydropower rents are invested in different areas compared to where higher unemployment rates prevail, measures can be implemented to encourage labor reallocation. This means incentivizing individuals to move to areas with priority investment projects that cannot be located elsewhere. These measures can take various forms, such as providing financial incentives for individuals to relocate, offering training and skill development programs specific to the needs of the investment projects, or establishing support systems to facilitate the transition and integration of workers into new areas.

Bhutan needs to create attractive job prospects for its growing number of young university graduates, while also making low-skilled positions appealing and accessible to the unemployed and inactive population, particularly women in urban areas. Given the skills and mismatches in Bhutan in the low-skilled segment, several sector-specific policies could be supported, including (i) upskilling policies such as vocational training after secondary education (through certificates and diplomas) and more demand-driven TVET (e.g. on-the-job training) to support employers with their training and vacancy needs, (ii) activation policies to stimulate the supply from uneducated individuals currently out of the labor force, especially women, and (iii) adequate job intermediation and matching systems to connect people to jobs and to track where the new jobs are created.

1.4. Policy priorities

This chapter has examined the growth trajectories of the Bhutanese economy under different resource revenue management models. The findings from this chapter translate into three principles that economic policy could follow to stimulate economic diversification:

- ▶ Bhutan is encouraged to capitalize on its existing comparative advantage in the hydropower sector, ensuring continued benefits for the country. The CGE model with no expansion of the hydropower sector has the lowest GDP as compared to the other three models with expansion of the hydropower sector, but it differs in how the extra hydropower revenues are being utilized.
- ▶ The growing hydropower rents could be re-invested in non-hydro sectors to support economic diversification. A diversified economy will be resilient towards shocks that could adversely affect the economy – for example, prolonged drought due to climate change (see Chapter 2 for discussion on climate change and agriculture in Bhutan).
- ▶ A successful diversification strategy should encompass both sector-neutral and sector-specific policies, and a sound institutional framework for supporting the latter.

The recommendations are categorized into hydropower, non-hydropower, and institutional options for managing hydro rents.

1.4.1. Hydropower development to leverage the current comparative advantage and ensure future hydro rents

The hydro sector could be developed further (subject to economic, environmental, and social impact analysis) given the untapped potential and opportunities in the regional electricity market in South Asia. The results of the CGE model indicate that the planned investment in additional hydropower leads to higher growth and government revenues.



As a carbon neutral country, Bhutan is in a unique, win-win position to positively contribute to its neighbors' Nationally Determined Contributions under the Paris Agreement on Climate Change by exporting its green hydropower. In addition, Bhutan's untapped potential can contribute to a regional power market fueled by clean power.⁸⁹ However, additional hydro investments require careful feasibility and impact assessments, including financing aspects (and macro-fiscal implications, including debt sustainability), in line with the Government's sustainable hydropower development strategy. Important trade-offs, including whether additional hydro capacity should be used to increase electricity exports or ensure adequate supply for domestic industries could be clarified by an IEU, as explained below. While serious technical issues can be a challenge even for the most advanced utilities, the capacity of the hydro sector institutions could be strengthened to effectively manage operations and trade.⁹⁰

The financing for future hydro projects will have to increasingly come from the private sector. Hydropower projects, so far, have been mostly financed through commercially priced loans and capital grants from the Gol, implemented under a special agreement between Bhutan and the Gol, in which the Gol covers both financial and construction related risks and commits to buying all surplus electricity at a price reflecting cost plus a net return. This has supported debt sustainability in the past.⁹¹ To date, three hydropower project have been developed under the Joint Venture (JV) and PPP model.⁹² Future projects will have to increasingly rely on private sector financing, given limited fiscal space and elevated public debt. Since guarantees from the Gol are not available, it will be necessary to have sufficient capacity to assess and handle the risks associated with these projects.

By establishing stronger backward linkages with the hydro sector, Bhutan could facilitate greater direct spillovers to the non-hydro sector and stimulate the demand for goods, services, and labor. Spillovers from the hydro sector to the non-hydro sector have been small due to the former's limited linkages with the rest of the economy, constraining the distributive effects of growth. The DGPC has established three subsidiaries to build domestic capabilities for hydro maintenance and engineering, and to construct small hydro plants.⁹³ Advancing these initiatives, possibly by increasing private sector involvement, has the potential to reinforce production linkages with other sectors and foster structural transformation.

The forthcoming Country Climate and Development Report (CCDR) will complement the analysis presented in the CEM by conducting an assessment on the potential to expand hydropower generation and exploring financing options. It will also evaluate the impact of climate change on hydropower generation and assets, examine the nexus with the agriculture sector and water availability and management, and identify climate resilient measures.

Positive spillovers from the hydro sector and the emergence of new sectors in the non-hydro sector will require adequate human and physical capital to diversify the economy further. Section 1.4.2 complements the macro agenda on economic diversification.

1.4.2. Policies to lay the foundation for (new) comparative advantages in the non-hydropower sectors

Policies to create a conducive environment for the development of the non-hydropower sector will help to sustain future growth. Over the past two decades, productivity growth in this sector has been relatively weak. This has become more prominent with the recent emigration. Policies that strengthen macroeconomic stability, improve institutions and the business environment, facilitate flexible and efficient labor market regulations, reduce barriers to trade, and investments in infrastructure as well as human capital remain critical for promoting continued growth in the non-hydro sector, as shown in CGE Scenario 3 (policies were proxied by human capital and infrastructure investments). A focus on the following areas, in particular, will help to achieve these objectives:

89 World Bank. 2021. "Program Document: Sustainable Hydropower Development Project". Project ID: P174327, World Bank, Washington, D.C.

90 The hydropower projects so far developed in Bhutan (and currently under preparation) have suffered complications due to unexpected complex geology and other technical challenges, which have resulted in significant cost-overruns and delays in commissioning.

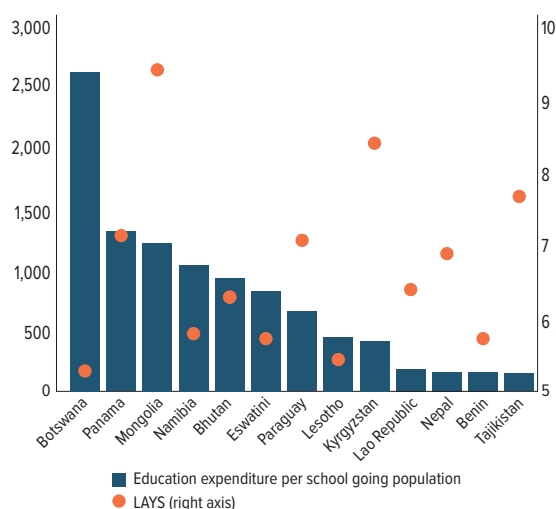
91 The share of capital grants in the total capital cost is about 30 to 60 percent depending on the project (with the remainder being financed by commercially priced loans).

92 Dagachhu (126 MW) and Nikachhu (118 MW, ongoing) have been implemented under the PPP model with the support of the Asian Development Bank (ADB) and the Government of Austria. Kholongchhu (600 MW, ongoing), which was initially implemented under the JV model between DGPC and an Indian SOE, has recently been taken over by DGPC.

93 DGPC has established three subsidiaries since 2012: (i) Bhutan Hydropower Services Limited to repair and manufacture hydro turbine runners and associated components; (ii) Bhutan Automation to manufacture automation systems for hydropower plants; and (iii) Druk Hydro Energy Limited to construct small hydro projects up to 150 MW.

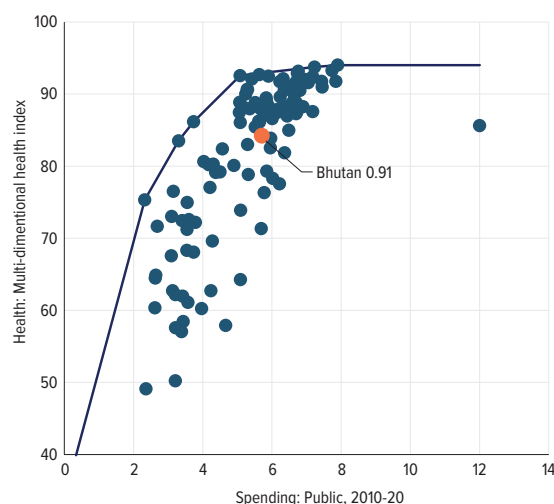
- **The capacity and performance of SOEs could be improved given their significant role in the economy.** While SOEs overall have consistently reported profits, driven by the electricity sector, SOEs in other sectors have shown a mixed performance. The 2023 Public Expenditure Review (PER) recommends strengthening SOE oversight and corporate governance by implementing a more centralized ownership model with clear reporting lines and responsibilities. Additionally, it suggests reviewing the current compact system and performance-based compensation of DHI and MoF to improve performance management. Promoting the professionalization and diversification of SOE Boards, as well as enhancing SOE investment management, are also crucial steps towards improving the overall performance of SOEs.
- **The efficiency of public expenditure in health and education could be improved.** The contribution of human capital to non-hydro sector growth has declined in the recent decade. While Bhutan spends more than most peers on education and health, there is significant scope for efficiency gains in both sectors. According to the Bhutan PER, Bhutan ranks 68th in education expenditure per school-age child among 131 countries with available data, while its ranking based on Learning Adjusted Years of Schooling (LAYS) is 86th (Figure 48). Bhutan's current health expenditure per capita in purchasing power parity terms is significantly higher than its regional peers and countries in the similar income group.⁹⁴ A Data Envelopment Analysis (DEA) using data from 164 countries shows that Bhutan could have achieved the same level of health outcomes with approximately 6 to 9 percent fewer resources if health expenditures were as efficient as the most efficient countries in the sample (Figure 49).

Figure 48: Education expenditure and LAYS



Source: Bhutan Public Expenditure Review (2023)

Figure 49: DEA Frontier analysis, health



- **In view of the potential skills mismatches in the low-skill segment, upskilling policies including vocational training after secondary education (through certificates and diplomas) and more demand-driven TVET programs, could help integrate the youth and low-skilled (particularly women) into the labor market and emerging industries.** While Bhutan has many public TVET institutions under the Ministry of Education and Skills Development (MoESD), their linkages with the labor market could be strengthened. In addition, labor activation policies and job intermediation and matching policies are essential for connecting job seekers with employers. Many self-employed and family workers, particularly those with low education and engaged in low-quality livelihood activities, could be provided with on-the-job assistance to cover some of their search costs and place them directly in regions with

94 Healthcare expenditures are predominantly financed by the Government and citizens receive free access to basic public health services, resulting in lower out-of-pocket expenditure than in upper middle-income countries.



available wage employment opportunities. Employment service centers under the Ministry of Industry Commerce and Employment (MoICE) can play a strong role in this respect.⁹⁵

- **Improving the efficiency in the PIM system is crucial to provide high quality infrastructure services and crowd in private investments.** The contribution of physical capital to non-hydro sector growth has declined over the recent decade, and there are significant investment deficits, including both soft and hard infrastructure. To improve the efficiency of public investments, the government could issue PIM guidelines, prepare and appraise new public investment projects in line with the guidelines, publish prioritization and selection criteria for projects, and designate a central entity to prioritize projects based on the criteria prior to their inclusion in the budget. Module 3 discusses some options for strengthening the financial sector to better channel hydro rents to non-hydro sector.

Sector-specific policies could complement other policies to support diversification, provided they are targeted, transparent and minimize budgetary costs. Given the critical role of human capital and talent for the diversification process, and to avoid further brain drain, several initiatives could be implemented in the short term as outlined below.

- **Bhutan could create strategic partnerships with universities to set up tailored executive programs adapted to the Bhutanese context.** Instead of relying on the provision of sector-neutral scholarships for Bhutanese citizens to study overseas, strategic partnerships with universities could constitute a promising way forward. This would provide the Government with greater leverage over the content of the training provided, to ensure it is aligned to government objectives and thereby reducing the need for foreign technical assistance over time. Such programs have been critical for the development of competitive sectors across the globe – for instance in the fruits sector in Chile through the Chile and University of California Program.⁹⁶
- **The Bhutanese living abroad could be leveraged for the transfer of learning, technology, and social capital back to Bhutan.** The IEU could identify and liaise with the Bhutanese living abroad to assess how they can contribute to the emergence of new activities in Bhutan. For instance, in Malaysia, to counter the shortage of technical skills for science and ICT, the Government set up the TalentCorp in 2011 to attract Malaysian talent back from abroad and to bring in foreign talent.⁹⁷
- **The existing incubation and acceleration centers could be strengthened to promote entrepreneurship and innovation.** These centers have the mandate to drive economic growth and create job opportunities for educated workers. However, they currently face funding uncertainties. Improving the quality of their services, including access to financing, market validation, business plan development, research and development support, mentorship, and connections to supply chains and markets, can better connect entrepreneurs to the broader entrepreneurial ecosystem.

1.4.3. Institutional setup to frame and implement sector-specific policies

A new fiscal strategy outlining a long-term vision and a minimum share of re-investment of hydro rents for productive capacity building in tradable sectors, could ensure that such rents support economic diversification away from over-reliance on the hydro sector. At the same time, the BESF and the fiscal stabilization measures that regulate contributions to and uses of the BESF could be operationalized to smoothen volatile hydro revenues and public spending in the face of negative shocks. One option could be the Hartwick rule, which suggests that the value of (net) investment needs equal the value of rents on extracted resources at each point in time.

⁹⁵ Alarief, J., et al. Forthcoming. "Bhutan Labor Market Assessment Report". Social Protection and Jobs Global Practice. World Bank, Washington, D.C.

⁹⁶ In Chile, to remedy the absence of adequate human capital, which was for a long time the obstacle for the development of the fruit sector, an exchange program was established in 1965 with the University of California. More than 80 Chilean graduate students were sent to study agricultural economics in California to learn how to cultivate and export fresh fruits in Chile. This appears to have been an extremely successful and impactful grant considering the growth of the sector during the following decades (Bravo-Ortega and Eterovic, 2015). See Bravo-Ortega, C. and Eterovic, N. 2015. "A Historical Perspective of a Hundred Years of Industrialization: From Vertical to Horizontal Policies in Chile." Working Paper No. 399. Department of Economics, University of Chile, Santiago, Chile.

⁹⁷ Mukherjee, H., et al. 2011. "Affirmative Action Policies in Malaysian Higher Education". Draft report submitted to the World Bank, Washington, D.C.

Given limited institutional capacity and human resources, it may be beneficial to consolidate different development finance institutions instead of spreading available resources too thinly. The CEM report highlights the different existing institutions, whose mandate could be expanded to invest hydropower rents in productivity-enhancing assets. While such a decision is political, the advantages and possible challenges of the different institutions are summarized below:

- ▶ **BDB:** The Bank has experience providing loans to SMEs. National development banks usually face more scrutiny than SDFs as the former have commercial credit ratings if they issue bonds. However, the current mandate and expertise of BDB is centered around SMEs in the agricultural sector and the Bank has limited capacity to take on a larger scope for funding structural transformation across various sectors and business types.
- ▶ **DHI:** There are various international experiences of government holding companies turning into development funds (e.g., Malaysia), and using DHI could avoid the creation of another fund and associated institutional costs. However, this would require a clear strategy to separate SOE management functions from the mandate of new investments (including in private companies) to stimulate structural transformation.
- ▶ **BoB:** The (state-owned) commercial bank has a track record of efficient lending and could expand its mandate to include development banking. However, this would require some restructuring and setting up legal frameworks to take on a broader mandate on behalf of the government.
- ▶ **BESF:** Expanding the mandate of the BESF to an SWF or SDF would enable it to attract private capital and engage in partnerships with foreign investors. However, SWFs and SDFs face less scrutiny than national development banks as the latter have commercial credit ratings if they issue bonds.

Irrespective of the institutional setup, it is crucial to enhance the capacity for investment appraisal, monitoring, and evaluation.

The establishment of an IEU-type structure in Bhutan could improve investment project decisions and efficiency. Ideally, an IEU should not only be high quality, but also be independent of the day-to-day pressures of policymaking as its aim is to work on the achievement of the long-term development vision. Possible candidates are the Ministry of Finance, given its central role in managing the nation's budget. Another potential home for the IEU is the newly created Office of the Cabinet Affairs and Strategic Coordination (OCASC) under the Committee for Coordinating Secretaries (C4CS), which replaced the Gross National Happiness Commission (GNHC). Among other responsibilities, OCASC oversees a strategic planning division, national policy coordination division, strategic evaluation division, and is in charge of the preparation of the FYP Strategic Planning. The C4CS is led by four coordinating secretaries (governance, economic, security, and social cluster), headed by the Cabinet Secretary, which could help improve cross-government coordination (especially when the project's impacts cross the boundaries of ministries), and also build a culture of evaluation across government.

The existence of a strong IEU could send a strong market signal to potential investors regarding the quality of economic management. An IEU could generate benefits such as larger FDI as well as greater portfolio investments, and policy credibility for international ratings agencies. For instance, further strengthening the capacity of the hydropower institutions to ensure that the development and construction, environmental and social stewardship, maintenance, dam safety regulations, and inspections of hydropower plants are in line with international best practices, could attract more foreign investment in other sectors. It could also assist multilateral agencies and bilateral donors in identifying potential ways to assist Bhutan with concessional finance and speed up their final decisions on committing funds, as there would eventually be a pipeline of rigorously assessed projects awaiting funding. In this way, a strong IEU would further strengthen Bhutan's international 'brand', and over time help establish a global reputation in delivering key investments, in line with the 13th FYP objective "To Rank Among the Top 20 Countries on Trust, Credibility and Integrity Indices" by 2030". This could attract additional FDI, venture and philanthropic capital, portfolio capital with an Environmental, Social and Governance (ESG) mandate, through, for example, 'green-tech'.

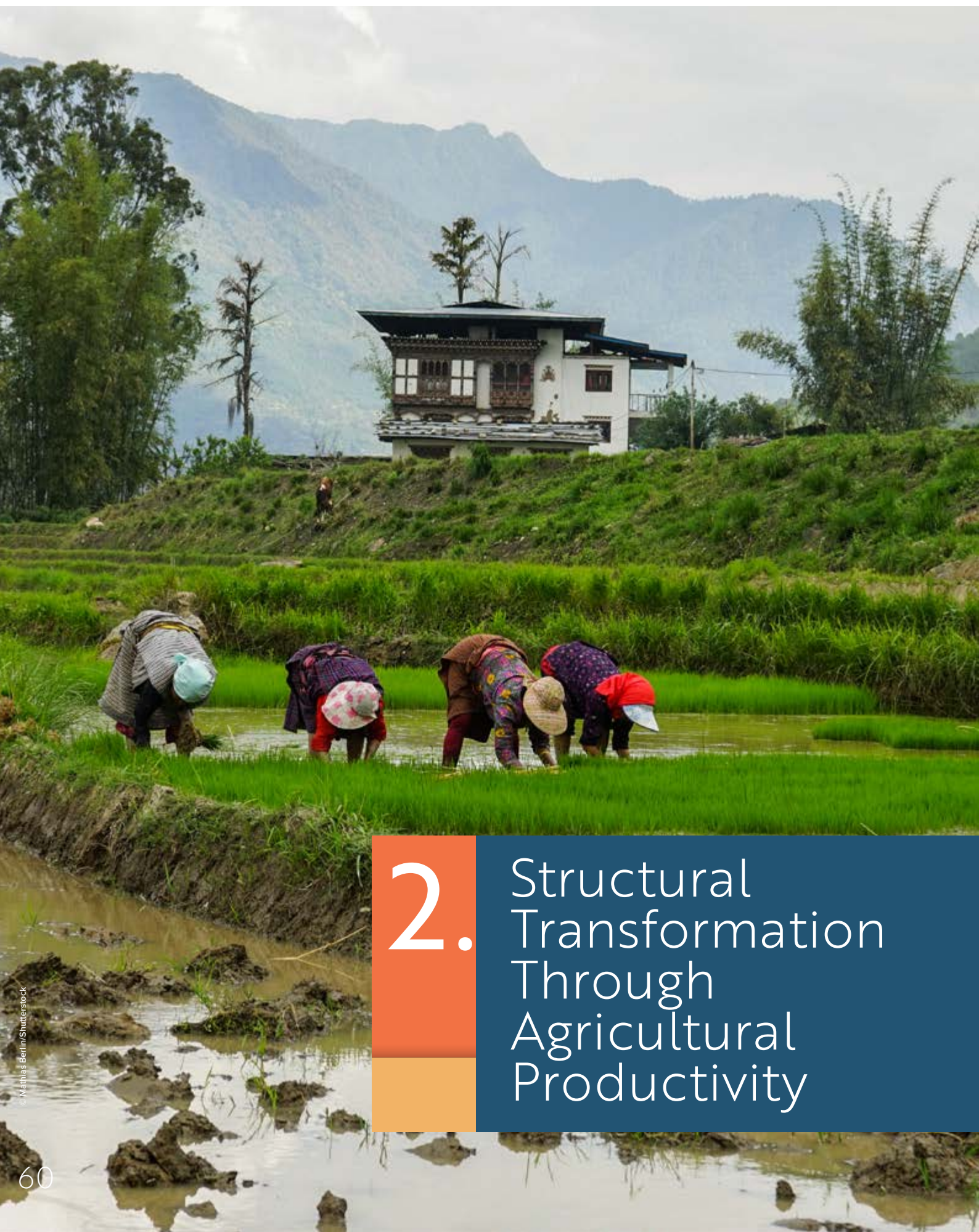
The IEU could grow in an incremental way, focusing on the peaks that have potentially the greatest returns, but which also pose the greatest risks. The IEU would need to carefully prioritize the allocation of its expertise across the evaluation of projects, especially in its early years when it is still building its own institutional capacities and will have a



limited number of staff. Initially, experts from other ministries, including sector ministries, could be seconded for limited periods of time to work with an IEU in the Ministry of Finance (or whichever institution provides the IEU's home) on evaluations that concern their sector focus, or for periods of training in evaluation techniques. Such secondments would also help sector ministries prepare requests for evaluation by the IEU when these involve large budgetary allocations or are likely to have complex effects (including larger than usual project risks). The IEU could prioritize the following tasks:

The IEU could evaluate *existing* policies to determine whether they are targeted, transparent and minimize budgetary costs (and risks). The recent PER has highlighted that several policy measures in Bhutan could be improved. For instance, tax incentives could be better targeted as they are costly and benefit mostly large and medium businesses in the manufacturing, financial, and tourism sectors. Similarly, TVET programs and their linkages with the labor market could be strengthened. SOEs generate substantial revenues (mainly through the hydro sector) but there are also opportunities to reduce fiscal costs and risks, including from loss-making real sector SOEs and SOEs in the financial sector. Strengthening the fiscal risk assessment, better SOE oversight, reporting and performance management, strong governance, and improved SOE investment management, could improve the performance of SOEs.

When considering *new policies and projects*, emphasis could be placed on evaluating those with the potentially greatest returns and risks (financial risks, but also environmental and community risks). These are the 'high peaks' discussed earlier in the report: they are projects that have the potential to be truly transformative for the economy but have a notable risk for failure, which can lead to large financial losses for the public sector (including debt service if the project is to be partly debt-financed) or irreversible environmental and social damage. The evaluation can also identify means to mitigate these risks if available.



2.

Structural Transformation Through Agricultural Productivity



2.1. Introduction

Bhutan's development path is characterized by a disparity between the composition of value-added and employment.

While Bhutan's growth has been driven by an expansion of industry and services, the country's population continues to be employed predominantly in the agricultural sector. Structural transformation has been much slower than that experienced in peers. Economists have long documented that structural transformation is the result of an interplay between agricultural productivity growth that reduces demand for agricultural labor and growth in industrial or service sectors that attracts former agricultural workers. Bhutan has not experienced this pattern because growth has been driven by hydropower, which is not labor-intensive, and thus does not tempt workers to leave agriculture. It does not directly impact agricultural productivity, leaving labor demand in agriculture unaffected. As the linkages of hydropower to the remainder of the economy are limited (see Chapter 1), Bhutan is yet to experience the forces of structural transformation that have helped other countries ignite high growth spells.

This Chapter explores whether efforts to increase productivity in agriculture can help kick-start structural transformation.

The Chapter thus complements Chapter 1 by exploring factors that 'push' workers out of agriculture. It argues that while structural transformation has been slow, Bhutan has experienced a gradual reallocation of workers from rural to urban areas. This shift has been associated with industrialization and service sector expansion in destination areas and increasing agricultural labor shares in the regions of origin. At the same time, agricultural production has remained rudimentary, with large productivity gaps and a decline in both yields and harvested areas of Bhutan's staple crops, rice and maize, on average. Simultaneously, however, pockets of modernization, such as increasing cereal yields in some areas, have emerged, and the sector has gradually reoriented itself towards its comparative advantages. This Chapter shows that precisely those areas, which have experienced cereal yield growth, have released workers into non-agricultural employment. Simulations from a CGE model also show that continued investment in agricultural productivity can be a driving force for structural transformation and can generate spillovers to wages and the service sector if production constraints – especially related to irrigation – can be overcome. Climate change may, however, present a challenge to this transition.

The Chapter is organized as follows: Section 2.2 provides an overview of the agricultural sector in Bhutan, examining both its contribution to employment, production structures and trends towards diversification. Section 2.3 explores the link between agricultural productivity and structural transformation, highlighting the existence of productivity gaps, identifying the constraints that drive the productivity gaps, and simulating the impact of their closure on the country's economic structure. Section 2.4 focuses on climate change, its impact on yields and on the sector's broader production structure. Section 2.5 concludes with a policy discussion.

2.2. Structural shifts in the agricultural sector

2.2.1. Agriculture continues to be Bhutan's main employer, especially in rural areas

The composition of value-added in Bhutan's economy has changed dramatically in recent years. The contribution of agriculture to output has declined significantly over the last two decades, from 25 percent of GDP in 2000 to only 12 percent in 2021. In contrast, the share of services in GDP has increased by 13 percentage points over the same period, from 37 to 50 percent.

Despite the decreasing share in value-added, labor continues to be confined to the agricultural sector. Structural transformation, defined as the movement of labor out of agricultural into industrial or service sectors, has been slow, with agricultural labor share declining by only 1 percentage point between the 2005 and 2017 census⁹⁸, from 45 to 44

98 This analysis relies on census data for the labor shares as subsequent analysis relies on a decomposition of labor shares at low geographic levels. Alternative, more frequent and recent data sources, such as the Labor Force Surveys, are not representative at the village level.

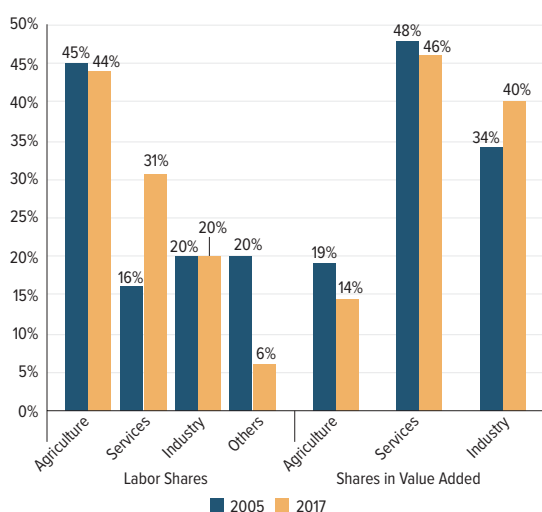
percent (Figure 50). This highlights that Bhutan has experienced an asynchronous process of structural transformation, in which economic output has effectively transitioned out of agriculture but workers continue to be engaged in the sector.

The low overall figure of labor movement out of agriculture masks differences across geographic areas. The spatial pattern of structural transformation indicates four types of areas that have experienced more rapid structural transformation than the rest of the country:

1. **Areas close to India** benefit from reduced trade costs and access to a larger market, which facilitates structural labor market shifts. For instance, the gewog of Samrang in the south-east borders the Indian state of Assam and has experienced a 60 percentage point reduction in agricultural labor share between 2005 and 2017, the largest reduction in Bhutan.
2. **Urban centers**, including those surrounding Paro, Thimphu, and Punakha in the center of the country, can produce agglomeration effects and economies of scale, and have seen substantial reduction in agricultural employment. These areas are also the most frequented by tourists, which has driven a reallocation towards services.
3. **Large hydropower developments** produce localized spillovers during construction and after commissioning. Examples include the Chukhha district, south of Thimphu, where the Tala hydropower plant was commissioned in 2007, and Trongsa district in the center of the country, where the Mangdechhu plant was commissioned in 2019.
4. **Areas connected to urban centers and the Indian market through road infrastructure**, such as Trashigang district in the south-east, have also experienced a modest movement of labor out of agriculture.

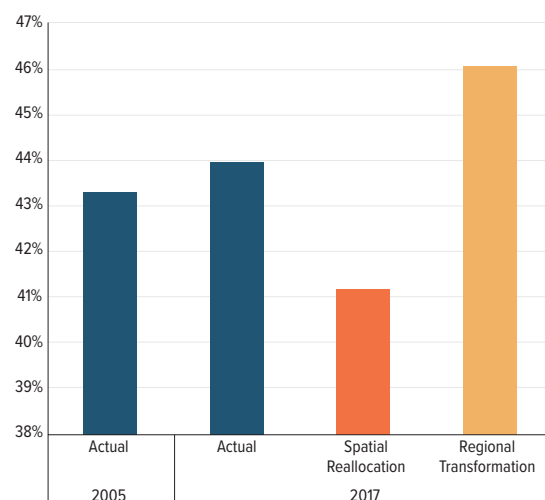
In contrast, rural and mountainous areas, such as in the north-west of the country, have increased their agricultural labor share (Figure 51).

Figure 50: While agriculture's contribution to GDP is low, the sector continues to act as the main employer in Bhutan...



Source: World Development Indicators and Bhutan National Accounts Statistics.
Note: The right-hand side graph uses gewog-level data. Due to changes in some gewog boundaries between 2005 and 2017, it only incorporates data of unchanged gewogs, which means that the figure on the aggregate change in the labor share differs from the national average highlighted in this section.

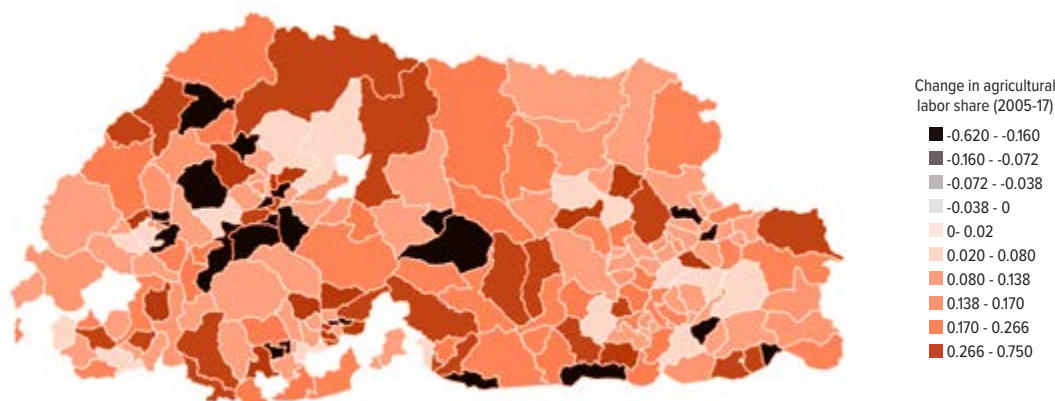
Figure 51: ...and any decline in agricultural transformation has occurred exclusively through a reallocation of labor from agricultural to non-agricultural areas.



Source: World Bank staff calculations using data from the Population and Housing Census 2005 and 2017, and the decomposition proposed by Eckert and Peters (2022).

Structural transformation has occurred through a spatial reallocation of workers rather than through a homogenous transition across space. Eckert and Peters (2022) show that the change in the agricultural labor share over time can be decomposed into two factors.⁹⁹ The first one – termed spatial reallocation component – is the share of structural transformation driven by workers moving from more to less agricultural areas, thus increasing the share of these areas in national employment. The second component is called regional transformation component; it measures the contribution of within-region changes in agricultural employment. Applying this decomposition methodology to gewog-level data from the 2017 and 2005 waves of Bhutan's Population and Housing Census (PHC) shows that structural transformation was exclusively driven by a reallocation of workers from more to less agricultural areas. In the absence of within-region structural transformation, the reallocation of labor that occurred between 2005 and 2017 would have reduced the national agricultural labor share by almost 3 percentage points below its actual level in 2017 (Figure 51). By contrast, had there been no internal reallocation of workers, the agricultural labor share would have exceeded the 2017 value by over 2 percentage points.

Figure 52: Structural transformation has centered around urban centers and select trading points at the southern border, whereas more rural regions have witnessed an increase in agricultural labor shares.



Source: World Bank staff calculations using data from the Population and Housing Census 2005 and 2017.

Note: Gewogs for which no data was available are shaded in white.

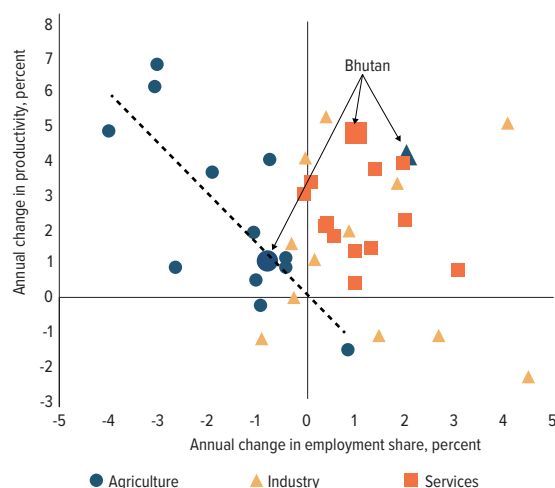
The heterogeneous progress in structural transformation aligns workers with emerging cross-regional differences in comparative advantages. The structural transformation experienced by Bhutan has resulted in (i) a *relative* polarization of agricultural labor in rural areas and (ii) a modest *absolute* reduction in agricultural activity. The reallocation of workers and the associated polarization of labor are a central mechanism that enables Bhutan's economy to overcome inherent characteristics that inhibit its competitiveness, including its mountainous terrain, high transport costs, and a low population density. This is because it allows for an accumulation of factors in areas that are relatively more competitive and have a comparative advantage in industry or service activities. This implies that economic policy should provide incentives and opportunities for labor to move from more to less agricultural regions, rather than attempting to achieve homogenous structural change throughout the country. The discussion in Chapter 1 aims to achieve this objective. It also implies that supporting growth in more agricultural regions will hinge on strengthening their comparative advantage in agriculture. The discussion in this module focuses on this aspect.

2.2.2. Agricultural value-added has fallen behind other sectors and comparators

Bhutan has experienced only slow gains in agricultural value-added per worker. Agricultural productivity growth averaged just 1 percent per year between 2000 and 2017, which puts Bhutan among the lower half of its peer countries (Figure 53). Between 1997 and 2019, value-added per worker in agriculture increased by only 26 percent, much less than in industry (84 percent) and services (178 percent; Figure 54).

99 Eckert, F. and Peters, M. 2022. "Spatial Structural Change" Working Paper W30489. National Bureau of Economic Research, Massachusetts.

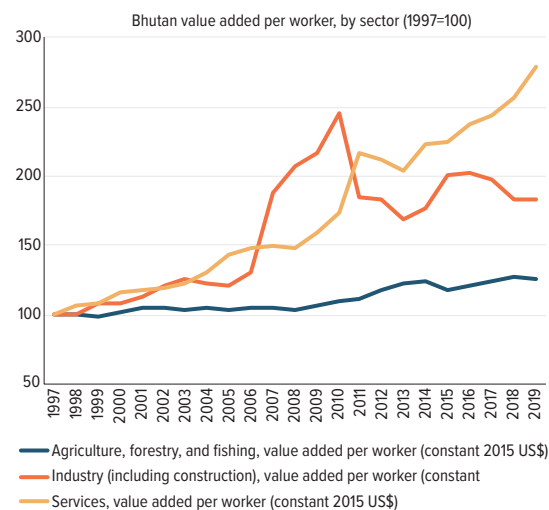
Figure 53: Agricultural productivity growth is key to facilitating a movement of labor to non-primary sectors...



Source: World Development Indicators.

Note: Figure 52 presents average annual changes (in percentage points) from 2000 to 2017 using the World Bank's Job Structure Tool.

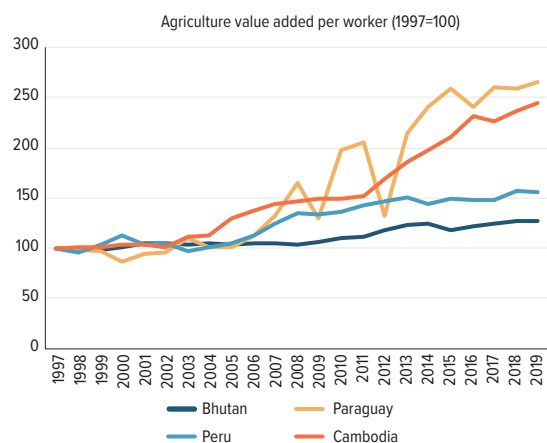
Figure 54: ...but productivity growth in agriculture has lagged in other sectors within Bhutan...



Source: World Development Indicators.

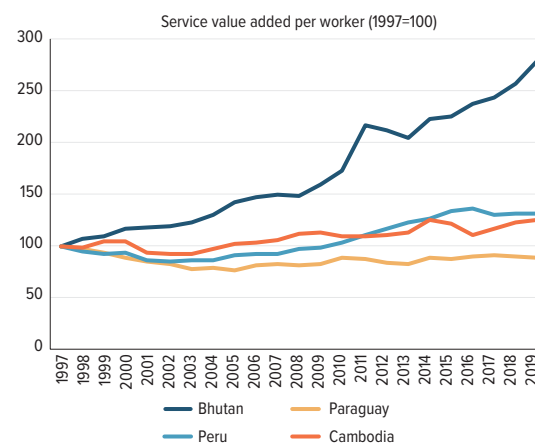
The productivity gains were dwarfed by the performance of aspirational peer countries, which have undergone a successful structural transformation process. Paraguay and Cambodia, for instance, were able to more than double value-added per worker in the agricultural sector over the same period (Figure 55). Peru's value-added per worker in agriculture exceeded Bhutan's level by 42 percent only in 1992 but had diverged by almost 100 percent by 2019 (Figure 56).

Figure 55: ...and was significantly lower than for peer countries...



Source: World Development Indicators.

Figure 56: ...in stark contrast to productivity developments in the service and industrial sectors.



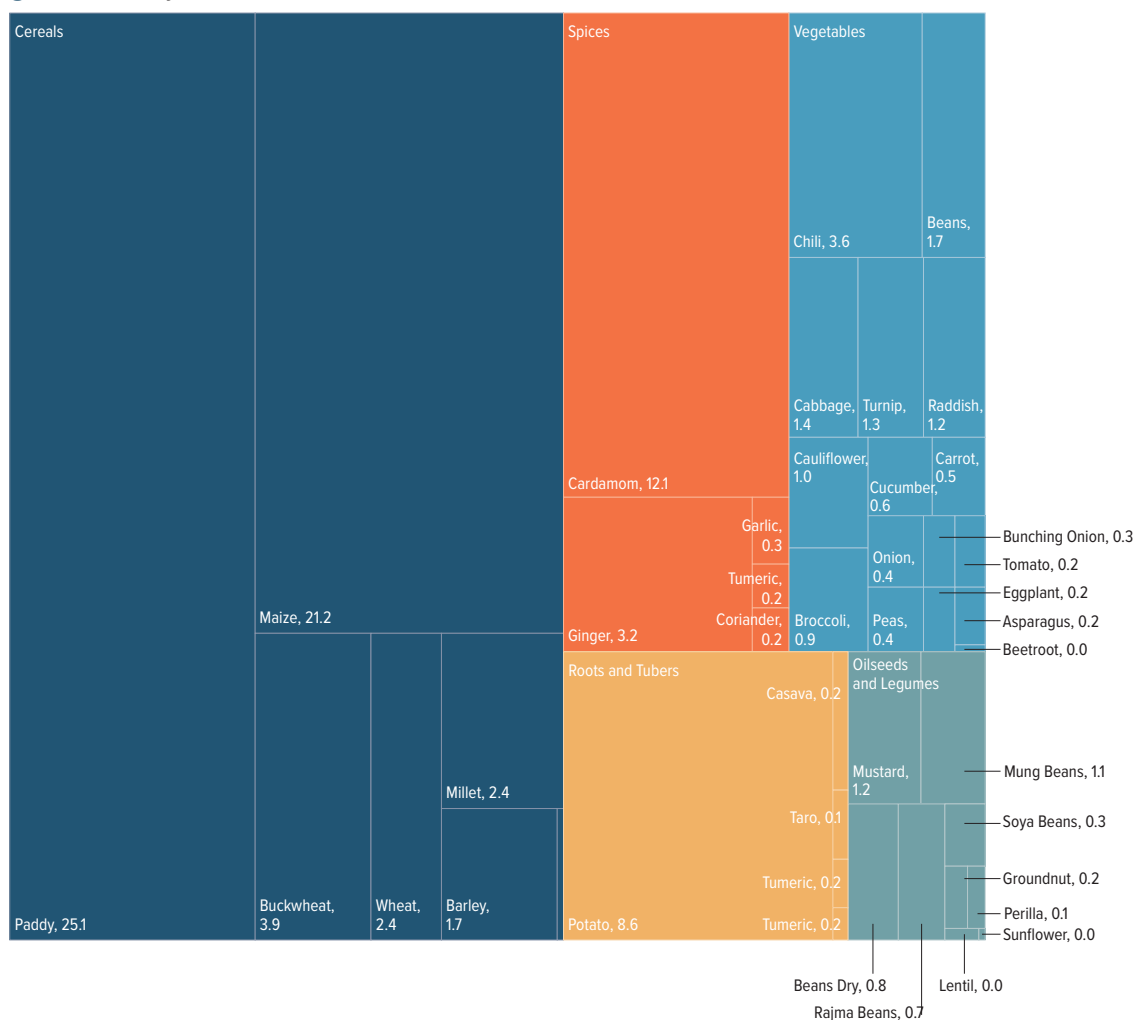
Source: World Development Indicators.

An empirical cross-country comparison showed that countries with larger agricultural productivity gains experienced more rapid structural transformation. Comparing Bhutan to the set of structural and aspirational peers revealed a strong negative association between agricultural productivity growth and agricultural employment share (Figure 55). Bhutan stands out as one of a few countries to have experienced slow productivity growth and a slow movement of labor out of agriculture.

2.2.3. The slow growth in agricultural value-added is driven by the reduced production of Bhutan's traditional crops

Bhutan's traditional crops are irrigated and rainfed paddy and rainfed maize. These two crops account for almost half of Bhutan's harvested area, with paddy occupying a 25 percent and maize a 21 percent (Figure 57) share. Cardamom (12 percent) and potato (9 percent) are the third and fourth largest crops produced. Within broader product groups, cereals account for most of the harvested area at 57 percent, followed by spices and vegetables. Most cereal production in Bhutan operates on a small scale, with farm sizes averaging about 2.5 acres and less than 18 percent of irrigated harvested area. Bhutan also limits irrigation to paddy, with most other crops produced under rainfed conditions or using wetland farming.

Figure 57: Paddy and maize dominate Bhutan's harvested area.

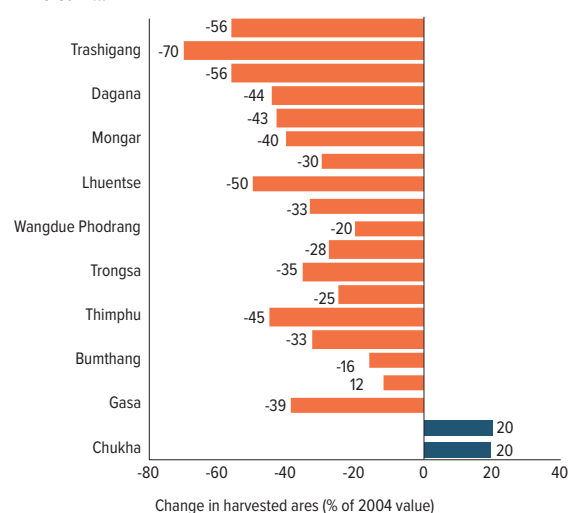


Source: Agriculture Statistics Reports, National Statistics Bureau. Note: The numbers show shares of a specific crop in total harvested area in 2021.

The area dedicated to these crops has declined in recent years. Bhutan's harvested area has declined consistently over the last decade, from a high of 214,000 acres in 2009 to 96,000 acres in 2021. This decline occurred across most districts but was most pronounced in the southern (e.g., in Samtse and Sarpang) and the eastern part (e.g., Trashigang; Figure 58) of the country. Underlying this development was a 57 percent reduction in the harvested area for cereals between 2004 and 2021 (Figure 59).

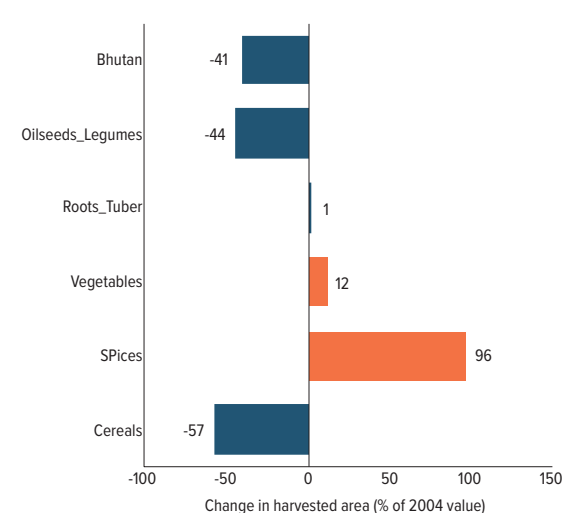
Yields of maize and paddy also decreased. Using data from two rounds of Bhutan's Renewable Natural Resource (RNR) Census, Dizon, Imtiaz and Yu (2022)¹⁰⁰ documented that irrigated paddy yields decreased over the last ten years. Between 2009 and 2019, the years of the RNR census, irrigated paddy yields decreased from 1.6 tons per acre to 1.1 tons per acre. A similar picture emerged for maize, for which yields decreased from 0.94 to 0.89 tons per acre.

Figure 58: Harvested area has declined across Bhutan...



Source: Agriculture Statistics Reports, National Statistics Bureau.

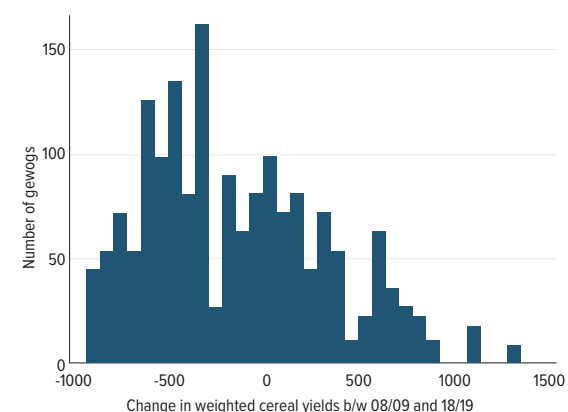
Figure 59:...driven by cereals (maize and paddy).



Source: Agriculture Statistics Reports, National Statistics Bureau.

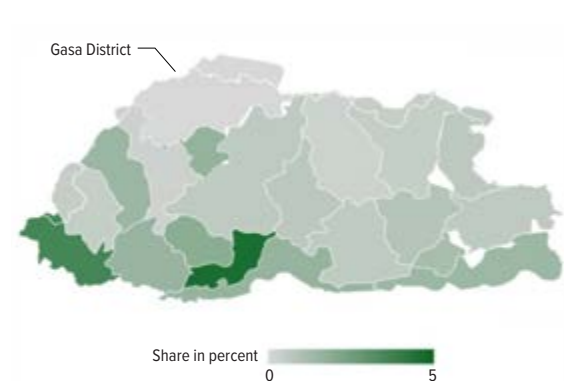
Changes in cereal yields differ across the country. Decreases in paddy and maize yields were concentrated in the southern regions, whereas the rest of the country experienced rising yields (Figure 60). With most arable land located in the south (Figure 61), this resulted in an overall decline in cereal yields.

Figure 60: Cereal yield changes were heterogeneous across Bhutan, with reductions focused in the south of the country...



Source: World Bank staff calculations using data from the Renewable Natural Resources (RNR) Censuses 2009 and 2019.

Figure 61: ...which is also the area where most agricultural production is located.

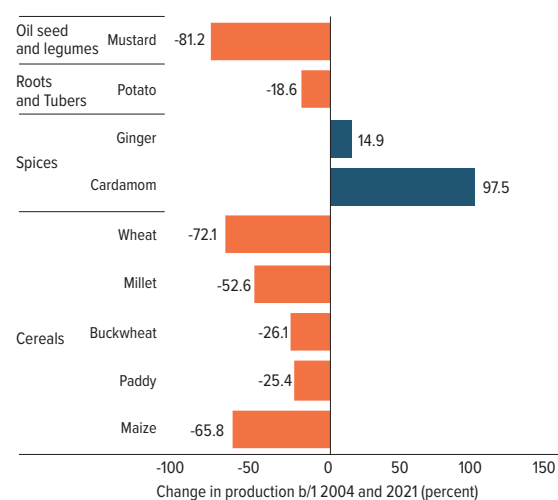


Source: World Bank staff calculations using data from [Agriculture Statistics Reports](#) and Statistical Yearbook 2022, National Statistics Bureau.

100 Dizon, F., Imtiaz, S., & Yu, J. 2022. "Water Constraints to Agricultural Productivity in Bhutan." Background Paper to the Bhutan CEM. World Bank, Washington, DC.

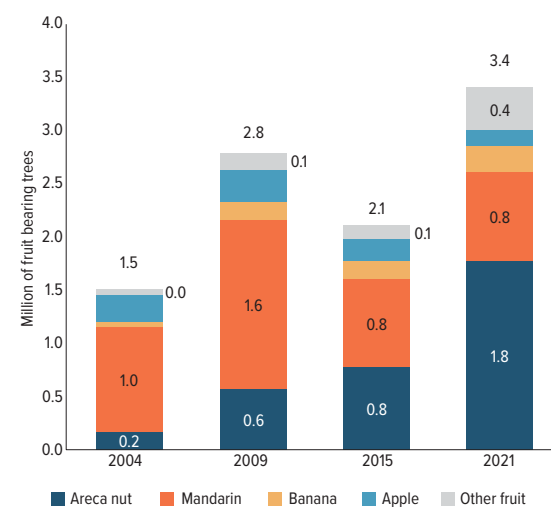
Lower harvested areas and lower yields for paddy, maize and other cereals resulted in reduced production. Between 2004 and 2021, paddy and maize output declined by 25 and 66 percent, respectively (Figure 62). This is symptomatic of a broader development for cereals, for which output declined across the board and was most pronounced in the case of wheat, for which output decreased by 72 percent over the same period.

Figure 62: Declines in harvested areas and yields have led to a drop in agricultural output of traditional crops...



Source: Agriculture Statistics Reports, National Statistics Bureau.

Figure 63: ...whereas the number of fruit trees planted has increased due to a rise in areca nut production.



Source: Agriculture Statistics Reports, National Statistics Bureau.

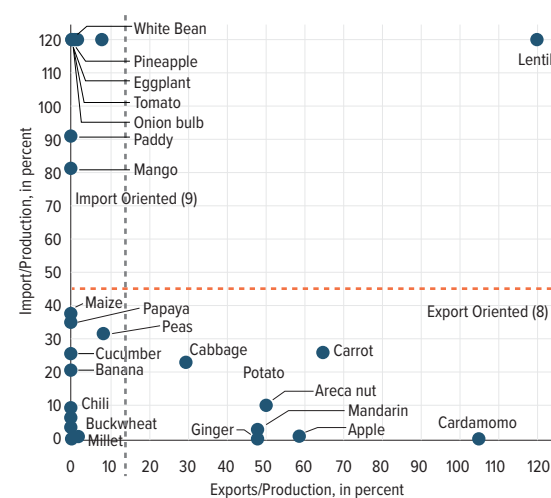
2.2.4. The agricultural sector is gradually transitioning from traditional to higher value products

In contrast to maize and paddy, agricultural production for select spices and fruits increased in recent years.

The harvested area for spices increased by 96 percent between 2004 and 2021 (Figure 59), driven by increased cardamom production, the output for which increased by 98 percent over this period (Figure 64). Fruit-bearing trees also increased substantially, rising by 126 percent (Figure 64). Fruit production is concentrated among three products (areca nut – 52 percent, mandarin – 24 percent, and bananas – 8 percent; Figure 65), with expanded output driven by an expansion of areca nut production, which increased from 200,000 trees in 2004 to almost 2 million trees in 2021 (Figure 65).

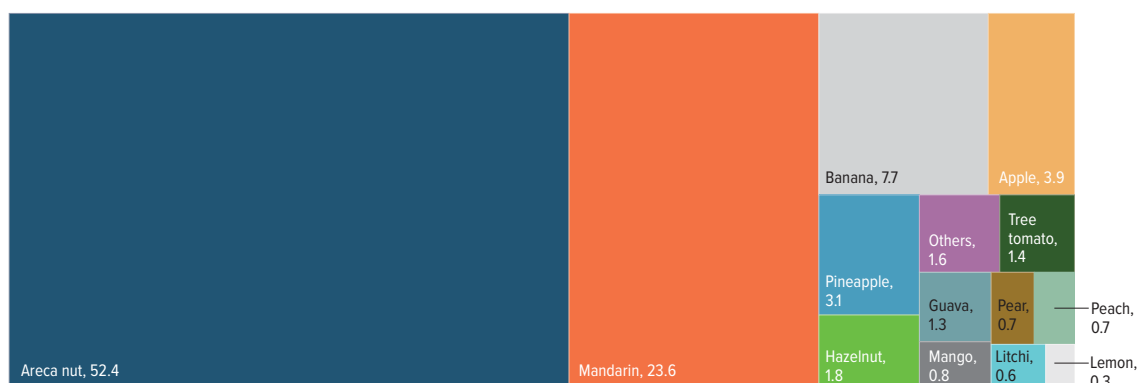
Increased production of cardamom and areca nuts has allowed Bhutan to increase its global market share in these products. Bhutan's agricultural exports have remained relatively constant over time and stood at 1.7 percent of GDP in 2021 (Figure 68). Cereals, even though they account for 57 percent of total harvested area, are negligible in terms of exports and most of them are used

Figure 64: Bhutan has an export niche in fruits, spices, and a few vegetables...



Source: World Bank Staff calculations based on "Self-sufficiency and Dietary Energy Supply of Food Crops in Bhutan" report, October 2021.

Figure 65: ...with fruit production dominated by areca nuts, followed by mandarins and bananas.

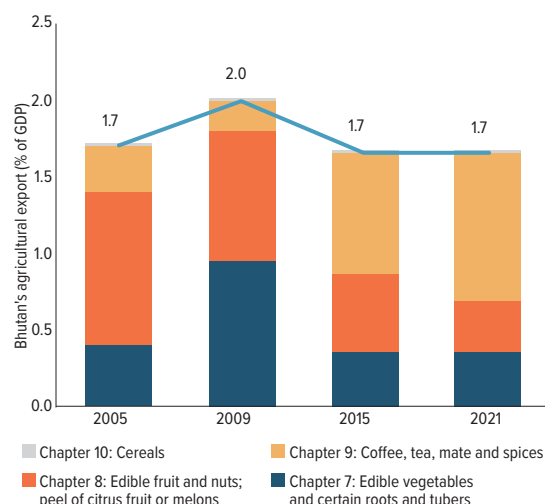


Source: Agriculture Statistics Reports, National Statistics Bureau.

Note: The numbers show shares of a specific tree in the total number of fruit trees in 2021.

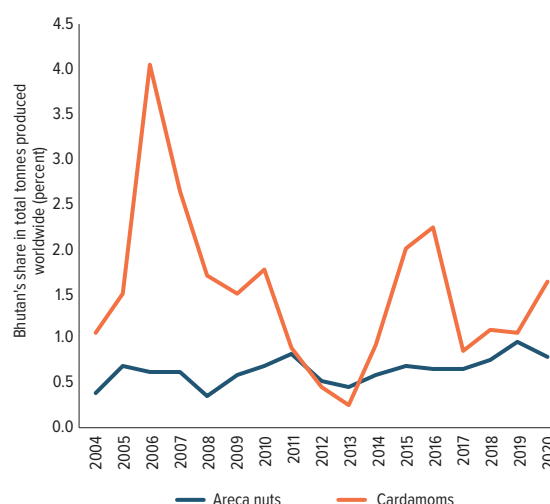
for domestic consumption. In contrast, exports under Harmonized Classification (HS classification) chapter 9 (including coffee, tea, maté, and spices) account for 60 percent of agricultural exports (with 61 percent for India). This has been driven by an increasing market share in global cardamom production, with Bhutan supplying 1.5 percent of the global market in 2021 (Figure 67). Exports under chapter 8 (edible fruits and nuts) account for 22 percent of total agricultural products exports, with only 40 percent destined for India. Most nut exports are accounted for by areca nut production, for which Bhutan has consistently increased its global market share in recent years, supplying almost 1 percent of the total global production in 2021 (Figure 65). In contrast, vegetable exports are highly concentrated and declining, with most accounted for by potatoes destined for India.

Figure 66: Spice, fruit and nut exports to global markets have gradually replaced potato exports to India...



Source: Food and Agriculture Organization Corporate Statistical Database (FAOSTAT).

Figure 67: ...allowing Bhutan to capture market shares in select niche products.



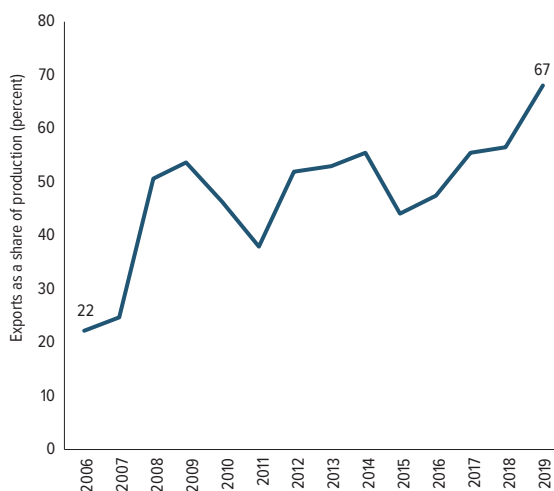
Source: Food and Agriculture Organization Corporate Statistical Database (FAOSTAT).

The move towards export niches indicates a broader re-orientation of the agricultural sector towards its comparative advantages. Bhutan's agricultural production can be classified into three groups — (i) Import-dependent crops, for which the import to production share exceeds 50 percent. These include, among others, paddy and wheat (Figure 66). These are items for which Bhutan has a revealed comparative disadvantage; (ii) Export-oriented crops, for which over



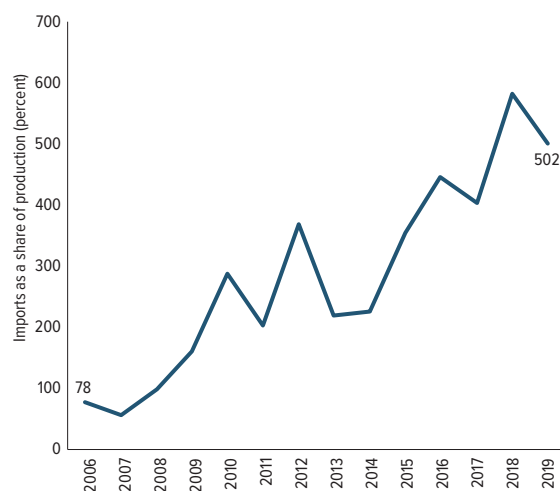
25 percent of production is exported. This includes high-value goods such as cardamom, areca nuts, and mandarins, in which Bhutan has a comparative advantage; and (iii) Other products in which Bhutan is self-sufficient, including maize. Over time, Bhutan has moved towards its comparative advantage, exporting more of its export-oriented production and importing more of its import-dependent products (Figure 68, Figure 69).

Figure 68: Over time export intensity of export-oriented products has increased...



Source: World Bank Staff calculations based on Self-sufficiency and Dietary Energy Supply of Food Crops in Bhutan report, October 2021.

Figure 69: ...whereas Bhutan increasingly relies on imports for products for which it is at a comparative disadvantage.



Source: World Bank Staff calculations based on Self-sufficiency and Dietary Energy Supply of Food Crops in Bhutan report, October 2021.

2.3. Productivity as a kick-starter of structural transformation

The literature has long documented a link between agricultural productivity and the movement of labor out of agriculture. On the one hand, increasing agricultural productivity directly supports growth in areas that have a comparative advantage in agriculture and can generate positive spillover effects to the livelihoods of predominantly rural populations.¹⁰¹ On the other hand, agricultural productivity growth can reduce labor demand in the sector and help harmonize marginal returns to labor between agricultural and non-agricultural activities, thus providing an incentive for workers to seek employment in industries and services.¹⁰²

This section shows that agricultural productivity increases in Bhutan have driven structural transformation in the past and will be crucial to accelerating it going forward. It shows – using two separate sources of geographic variation – that those areas which experienced yield growth or transitions towards higher value products also experienced changes in their agricultural labor shares. The section then uses an econometric estimation technique to argue that current yields in Bhutan remain below their potential due to production constraints. Simulating the closure of these productivity gaps using a CGE model shows that such a policy intervention has the potential to rapidly increase structural transformation and generate significant spillovers to non-agricultural sectors.

¹⁰¹ There is, for instance, evidence that the adoption of higher productivity crops during the Indian green revolution significantly enhanced agricultural employment and incomes. See Moscona, J. (2018). "Agricultural Development and Structural Change Within and Across Countries". Mimeo, MIT.

¹⁰² See Bustos, P., Caprettini, B., and Ponticelli, J. 2016. "Agricultural Productivity and Structural Transformation: Evidence from Brazil". *American Economic Review*, 106(6), 1320-65.

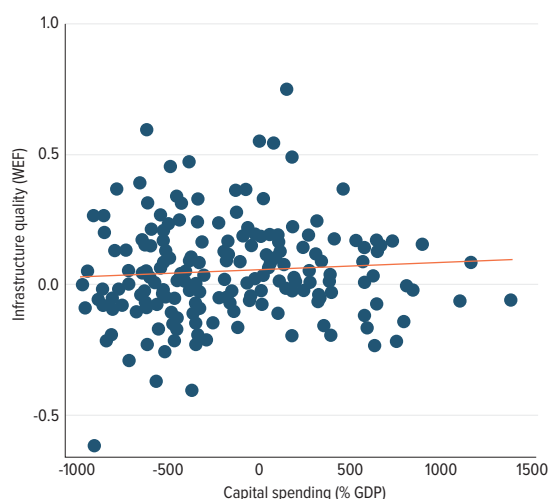
2.3.1. Within Bhutan there is a statistical relation between more productive agriculture and the release of labor

A relation between agricultural labor shares and productivity in the sector exists both on the intensive and the extensive margin. On the intensive margin, areas that have experienced cereal yield growth have increased their agricultural labor share and have experienced an outward movement of workers. A similar pattern, albeit less pronounced, is visible in the extensive margin shift from cereals towards fruit trees. Both patterns indicate that productivity improvements release labor to other sectors.

Cereal yield increases are associated with increasing agricultural labor shares and an emigration of workers. Figure 62 in section 2.2.3 has documented substantial heterogeneity between gewogs in yield changes between the 2009 and 2019 RNR census. Combining the data on yield changes with information on changes in employment changes from the PHC shows that those gewogs, which experienced a larger change in cereal yields between 2009 and 2019, experienced an increase in their own agricultural labor share (Figure 70) and a decrease in their share of national employment (Figure 71).

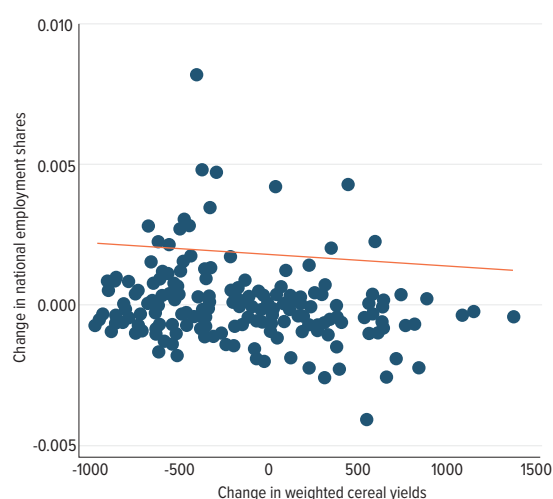
A regression approach confirms that the visual relation is statistically significant. A 1 ton per acre increase in yields is associated with a 0.04 percentage point reduction in a gewog's share in national employment. At the same time, gewogs that experience cereal yield increases become more agricultural, with a 1 ton per acre increase associated with a 2.7 percentage point increase in agricultural labor share. Both estimates are statistically significantly different from zero at conventional levels of confidence. The increase in cereal yields is also concentrated among those regions that had relatively higher agricultural labor shares in 2005. These factors provide prima facie evidence that the geographically focused structural transformation experienced by Bhutan is linked to agricultural productivity growth.

Figure 70: Regions that experienced higher cereal yield growth increase their own agricultural labor share...



Source: World Bank staff calculations based on data from the PHCs 2005 and 2017 and the RNR censuses 2008 and 2018.

Figure 71: ... while decreasing their share of national employment



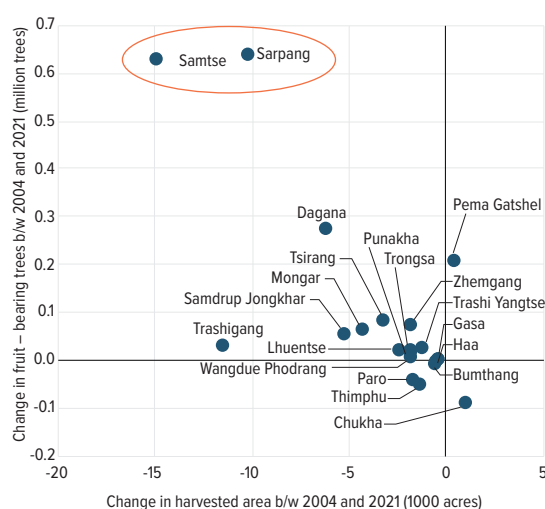
Source: World Bank staff calculations based on data from the PHCs 2005 and 2017 and the RNR censuses 2009 and 2019.

Note: The scatter plot excludes outliers where change in employment share exceeds 3 percent and -0.5 percent. The linear fit line includes these outliers.

Similarly, districts that reduced their harvested area from crops in favor of fruit trees are more likely to have experienced a reduction in their agricultural labor share. Section 2.2.4 has documented a reduction of harvested area in some parts of Bhutan and an increased reliance of production on fruit trees for areca nuts. These two developments

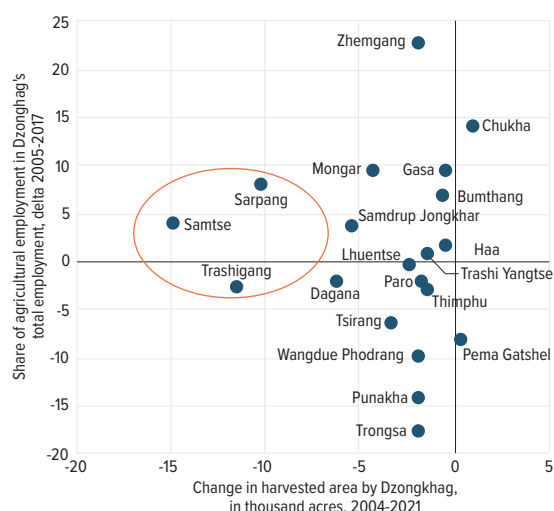
are linked, as those gewogs which experienced a reduction in harvested area are also more likely to experience an increased number of fruit-bearing trees (Figure 72). At the same time, the two districts – Samtse and Sarpang – which experienced the largest reduction in harvested area and increase in fruit-bearing trees, also experienced considerable increases in their agricultural labor shares of 3.8 and 7.7 percentage points between the 2005 and 2017 census (Figure 73). Samtse's share in national employment decreased by 1 percentage point and Sarpang's share marginally increased by 0.6 percentage points over the same period.

Figure 72: The dzongkhags with the largest drop in harvested area had the largest increases in the number of fruit trees...



Source: Agriculture Statistics Reports, National Statistics Bureau

Figure 73: ...and the largest decline in agricultural labor share.



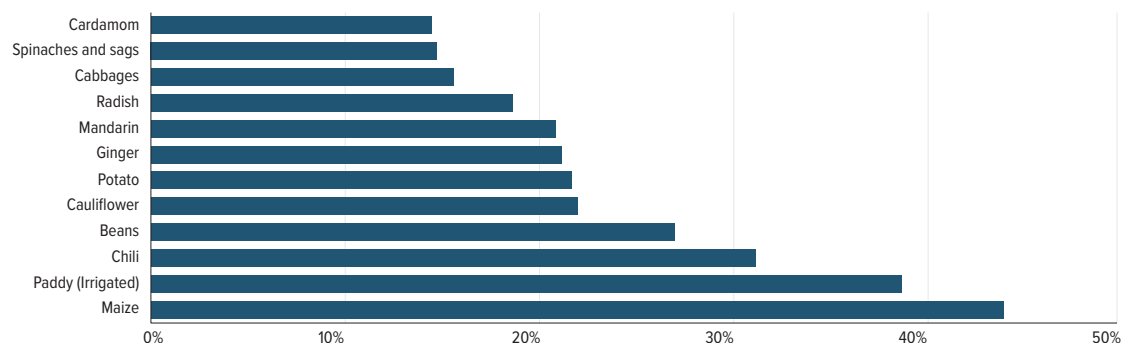
These patterns are consistent with the broader experience of structural transformation in South Asia. Asher et al. (2022) studied irrigation canals in India over 150 years and found that canal areas have higher land productivity and population density relative to neighboring non-canal areas, but that there is no long-run change in the share of the workforce outside of agriculture or even in agro-processing. Instead, structural transformation occurs via higher growth rates in nearby towns, suggesting that the transformation is one that occurs in movement across space as opposed to across sectors (within the same area). Related work in India by Blakeslee, et al. (2023) found that large-scale irrigation increased agricultural output, population, and wealth in the program areas, but there was a decline in population, non-agricultural employment, and firm activity in nearby towns.

2.3.2. Agricultural productivity in Bhutan is below its potential

Yield potential can be estimated through a regression that predicts potential yields at the chiwog-level based on reported constraints and controlling for local conditions.¹⁰³ This exercise highlights that Bhutan has substantial potential to increase yields and kick-start structural transformation. Yield potential growth is largest for maize, for which the predicted potential yield is over 1.3 tons per acre, 44 percent more than the average current yield (Figure 74). Irrigated paddy also has substantial yield potential at 1.6 tons per acre, 39 percent more than the actual average. In addition to cereals, vegetables – including chili, beans, cauliflower, and potato – also hold significant potential to increase yields.

¹⁰³ The analysis presented in this section uses data from the two RNR censuses and compares yield differentials across neighboring chiwogs, thus controlling for differences in exogenous production determinants that are fixed for neighboring villages and for other, observable, production characteristics. In addition, the analysis controls for self-reported production constraints through a regression approach. Yield potential is then defined as the predicted yield of the top 10 percent of holdings when production constraints are alleviated.

Figure 74: Current yields are significantly below their potential

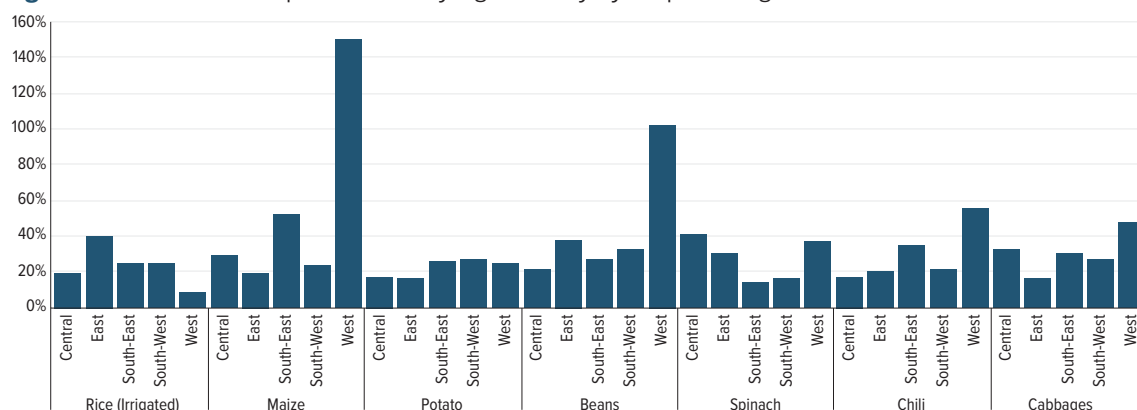


Source: World Bank staff calculations based on data from the Renewable Natural Resources (RNR) Census.

Note: The figure shows the estimated yield gaps by crop.

Yield potentials vary by region. The regressions highlight that there is substantial potential to increase maize production in the south-eastern region¹⁰⁴, with potential increases amounting to 52 percent of current yields (Figure 75). Similarly, growth potential in the central region¹⁰⁵ amounts to 29 percent of current yields. While the data also suggests large growth potential for the Western region¹⁰⁶, these estimates are associated with a large variance due to a limited sample size. In contrast to maize, irrigated paddy potential is more focused on the eastern region¹⁰⁷. The south-western region¹⁰⁸ has large yield gaps for select vegetables, such as potatoes, beans, and cabbage, in addition to considerable growth potential in rice.

Figure 75: Yield increase potentials vary significantly by crop and region



Source: World Bank staff calculations based on data from the Renewable Natural Resources (RNR) Census.

Note: The figure shows the potential increase in yields by crop and region.

2.3.3. Productivity gaps can be closed by alleviating production constraints

Productivity gaps arise because farmers face production constraints. To estimate the importance and impact of different constraints on yields, this section presents results from an econometric analysis that compares average yields between villages with higher and lower shares of households reporting a given constraint.¹⁰⁹ This approach controls for factors that are similar between neighboring villages, such as climatic conditions or soil suitability. In addition, the estimates control

¹⁰⁴ The south-eastern region as defined here contains Samdrup Jongkha, Sarpang and Zhemgang dzongkhags.

¹⁰⁵ The central region has Bumthang, Gasa, Punakha, Trongsa and Wangdue Phodrang dzongkhags.

¹⁰⁶ The western region comprises Haa, Paro and Thimphu dzongkhags.

¹⁰⁷ The eastern region includes Lhuentse, Mongar, Pema Gatsel, Trashigang, and Trashi Yangtse.

¹⁰⁸ The south-western region comprises Chukja, Dagana, Samtse, and Tsirang dzongkhags.

¹⁰⁹ The detailed econometric results are reported in Dizon, F., Imtiaz, S., and Yu, J. 2022. "Water Constraints to Agricultural Productivity in Bhutan". Background Paper to the Bhutan CEM. This spatial first difference approach is based on Druckenmiller, H., and Hsiang, S., 2018. "Accounting for Unobservable Heterogeneity in Cross Section Using Spatial First Differences". NBER Working Papers 25177, National Bureau of Economic Research.



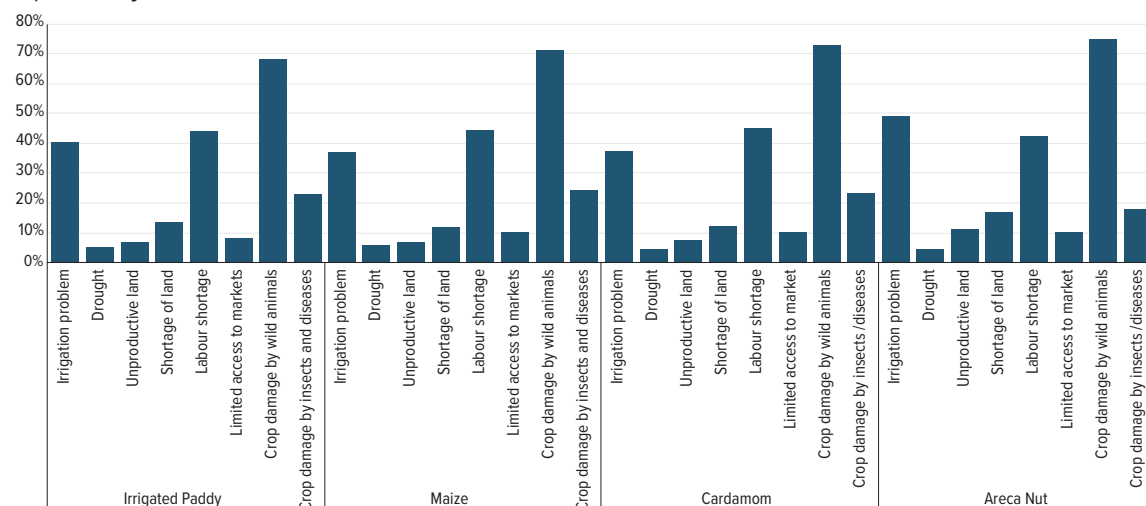
for a set of farm-level characteristics. The production constraints considered in the analysis are those reported in the RNR censuses, including irrigation problems, drought, unproductive land, shortage of land, labor shortage, limited access to market, excessive rain, hailstorm or winds, landslides, crop damage by wild animals, and crop damage by insects or diseases.¹¹⁰ The section first discusses the prevalence of these constraints and then presents estimates of their impact on yields.

Challenges related to water supply are frequently reported by farmers. Problems with irrigation are consistently the **most** frequently reported problem across all crop-producing villages. Among rice-producing chiwogs, about 40 percent of holdings reported irrigation problems as a constraint in the 2019 RNR census (Figure 76). Similarly, about 6 percent of holdings reported drought as a constraint. These shares are similar for other crops, ranging from 37 percent for maize-producing to 49 percent for areca nut-producing chiwogs.

Human-wildlife interactions also reportedly result in production constraints. Crop damage by wild animals was reported more frequently in 2019 compared to 2009, with 68 percent of rice-producing holdings and 71 percent of maize-producing holdings reporting it as a constraint in 2019. This was 5 and 7 percentage points more for rice-producing holdings and maize-producing holdings, respectively, than in the previous census round. In contrast, crop damage by insects and disease is now less prevalent, with only 23 percent of households in rice- and 24 percent of households in maize-producing villages reporting it as a constraint. Similarly, about three-quarters of cardamom- and areca nut-producing holdings report crop damage by wild animals as a major concern.

Labor shortages are another constraint reported by farmers. Between 42 and 45 percent of holdings producing paddy, maize, cardamom, and areca nuts report that labor shortages impede their production. While labor shortages thus remain a challenge, the share of holdings reporting it as a key obstacle dropped by about 6 percentage points on average between the 2009 and 2019 RNR census.

Figure 76: Irrigation problems, labor shortages, and crop damage are among the main constraints reported by farmers.



Source: World Bank staff calculations based on data from the Renewable Natural Resources (RNR) Census.

Note: The figure shows the percentage of farmers reporting a given constraint.

The estimation results show that these challenges result in significant yield losses for farmers. Irrigation problems cause a substantial reduction in yield for paddy rice. Removing irrigation problems for the 40 percent of affected holdings would raise average yields by 68 kg per acre, or about 6 percent for irrigated paddy (Figure 77). Similarly, alleviating the constraint for maize would raise average yields by 6.1 percent. Droughts result in lower yields for maize (removing

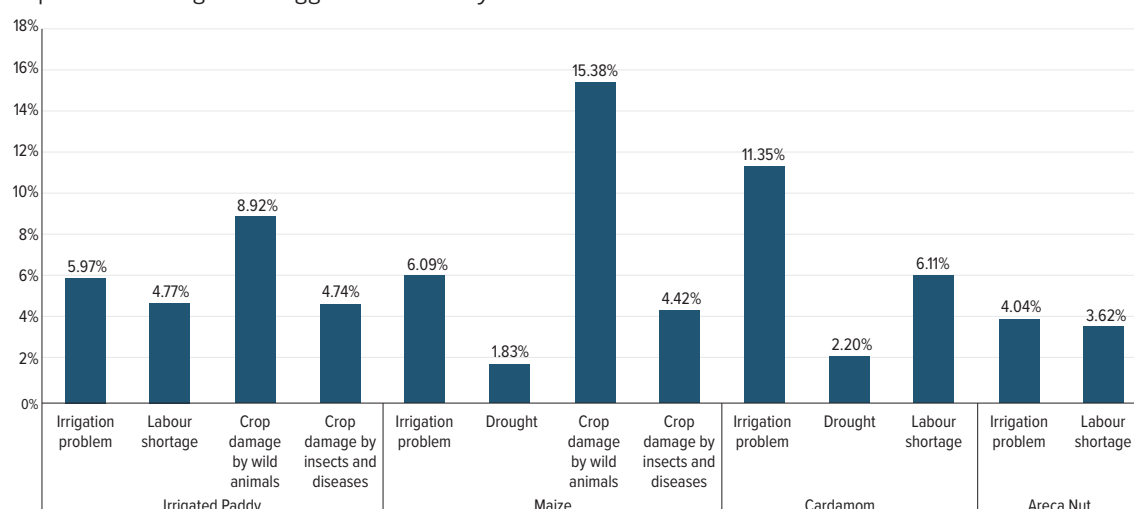
110 This section focuses on Bhutan's two traditional crops, rice and maize, and two export-oriented crops, cardamom and areca. A broader set of results is available in the background paper.

their impact would raise yields by 1.5 percent) but have an insignificant impact on rice yields. This is expected because maize – in contrast to irrigated paddy – relies to a larger extent on rainfall. Irrigation problems also severely affect yields for cardamom and areca nuts. The alleviation of this constraint could raise cardamom yields by 11 percent and areca nut yields by a more modest 4 percent. Cardamom yields also suffer because of droughts, so a reliable water supply could raise yields by 2.2 percent.

Crop damage has, by far, the largest impact on yields for paddy and maize. The estimation results suggest that removing this constraint for affected farmers could raise yields by 9 and 15 percent for paddy and maize, respectively. Besides crop damage by wild animals and water constraints, crop damage by insects and disease are a tertiary constraint for paddy and maize, which, if addressed, would increase average yields by 4.7 and 4.4 percent, respectively.

Removing the impact of labor shortages – for instance through the adoption of labor-saving technologies – could also raise yields. Overcoming labor shortages could increase paddy, cardamom and areca nut yields by 5, 6, and 4 percent, respectively. The alleviation of this constraint does not necessarily require the allocation of additional labor to the sector. This could be achieved through the adoption of labor-saving technologies (see simulations in section 2.3.4).

Figure 77: Ensuring access to water, overcoming labor shortage through productivity, and protecting crops from damage can trigger substantial yield increases.



Source: World Bank staff calculations based on data from the Renewable Natural Resources (RNR) Census.

Note: The figure shows the impact on yields (as a percentage of 2019 average yields for the overall country) of removing a given constraint. It only reports statistically significant constraints.

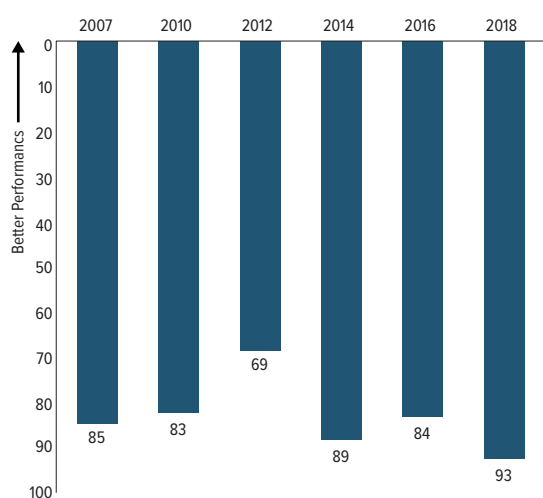
The impact of different constraints varies by geographic area. For instance, in the eastern and south-western part of Bhutan, maize production is most constrained by water scarcity, whereas the effect on paddy is driven by the western region. Crop damage by wild animals is also most likely to impact paddy in the western region, whereas this constraint is most prevalent in the south-east for maize.

The results are consistent with a broader literature linking production constraints to yields in Bhutan and beyond. Using the 2009 RNR census, the International Food Policy Research Institute (IFPRI) (2010) notes that the self-reported top constraints to farming are wildlife, insects/plant diseases, irrigation, and labor shortage. Using propensity score matching techniques, they find that improved quality of land (i.e., irrigation) is strongly related to productivity. Cursory policy simulations indicate that irrigation investment programs provide larger returns, compared to, for instance, rural roads and wetland protection. More broadly, yield growth in the South Asia Region (SAR) has been attributed to an extent to the expansion of irrigation (Morita, 2021). In other contexts, Jones et al. (2023) study hillside irrigation schemes in Rwanda and find that such schemes enable dry season horticultural production (essentially adding a season focused on water-intensive crops), thereby boosting on-farm cash profits by 70 percent.



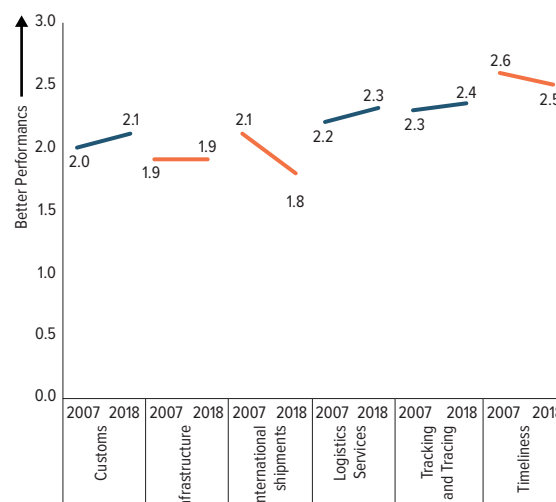
The impact of other constraints, which cannot be captured quantitatively using RNR census data, include difficult transport and export logistics. Due to its mountainous topography and low population density, improving transport logistics is a major challenge in Bhutan. The country's infrastructure has started falling behind its peer countries. For instance, Bhutan's ranking in the Logistics Performance Index has decreased, from 69 in 2012 to 93 in 2018 (Figure 78). This decline is driven by slow progress (and marginal regressions) in key areas, such as infrastructure, customs, and international shipments, whereas Bhutan's comparator countries have consistently improved (Figure 79).

Figure 78: Bhutan's ranking in trade logistics has decreased in recent years...



Source: World Bank's International Logistics Performance Index.

Figure 79: ...owing to a decrease in infrastructure, international shipments and timeliness ratings, and only a modest improvement in other areas.



Bhutan's difficult topography also impacts land productivity. Only 13.5 percent of Bhutan's land surface is arable, under permanent crops, or under permanent pastures, putting it at the bottom of the global distribution of agricultural land area (Figure 82). While having a low agricultural area is often cited as a constraint to growth in the sector, Bhutan's low population density means that substantial growth opportunities remain. Indeed, the country ranks 68th in the world when calculating the share of arable land per capita (Figure 83). More than 31 percent of agricultural land is on slopes greater than 50 percent¹¹¹, which is not only challenging to cultivate but is also associated with soil and nutrient losses when traditional farming practices are applied. As a result of the difficult topography, around 64,000 acres of farmland remain fallow.

2.3.4. Closing productivity gaps can accelerate structural transformation

This section estimates the macroeconomic impacts of closing parts of the yield gap shown in Figure 74.¹¹² The estimation relies on a CGE model designed specifically to capture the key characteristics of Bhutan's economy (see description in Box 8). In order to evaluate the ability of agricultural productivity growth to accelerate structural transformation, the model is used to simulate a 20 percent reduction in Bhutan's existing yield gaps through a joint improvement in the quality of agricultural capital (better machines), fertilizers and pesticides (more effective chemicals), and fuel (better quality fuels). The simulated yield improvements that form the basis of the productivity improvement scenario are shown in Figure 83.

111 MoAF. 2017. "Agriculture Land Development Guideline (ALDG) – 2017". Thimphu, Bhutan, citing the National Soil Services Center, MoAF. 2011. Land Cover Mapping Project 2010.

112 In the stylized CGE scenarios, estimates for specific crops are taken as representative of the broader crop group weighted by land area under cultivation where necessary.

Figure 80: Bhutan is ranked 170th among 208 countries in terms of its agricultural land area...

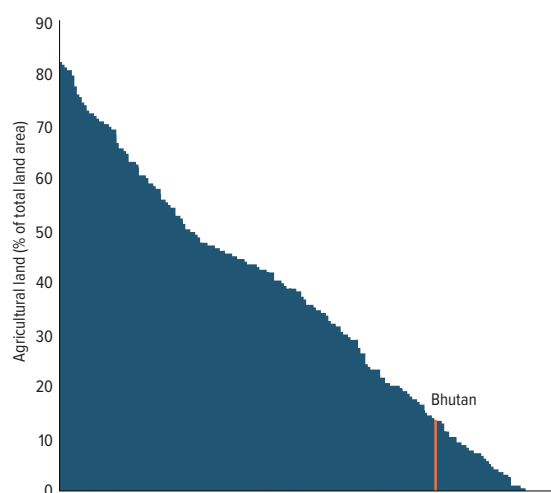
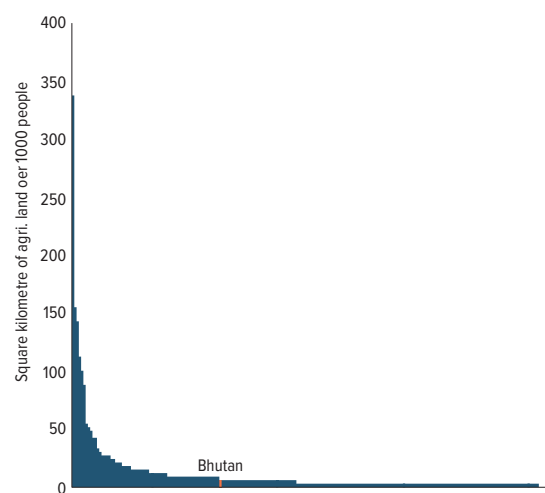


Figure 81: ...but 68th when the low population density is considered.



Source: World Development Indicators

Note: Agricultural land refers to the share of land area that is arable, under permanent crops, and under permanent pastures. Arable land includes land defined by the Food and Agricultural Organization of the United Nations (FAO) as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow.

The model shows that increasing non-labor productivity affects marginal returns to different production factors, and thus impacts wages and returns to land. Increasing productivity and yields have modest and ambiguous impacts on agricultural wages. On the one hand, agricultural wages in the central, eastern, and western regions decline slightly, as marginal products decline, and labor gets crowded out by technology ('the crowding-out effect'; Figure 84). On the other hand, more efficient agricultural production also has an 'income effect', because it increases output and incomes of landowners, among others, and therefore boosts demand. The income effect dominates the crowding-out effect in the southern parts, where agricultural wages increase slightly in response to the increase in non-labor productivity. Outside of agriculture the income effect prevails throughout the country, with higher yields increasing un- and low-skilled wages.

As low-skilled and unskilled wages rise by more than agricultural wages, households are incentivized to supply labor outside of agriculture. As a result of changing relative wages, the supply of agricultural labor is lower, and the supply of unskilled and low-skilled labor is higher in the agricultural productivity scenario compared to the reference scenario (Figure 85). This structural change in the labor market occurs when higher relative wages outside agriculture incentivize households to supply their labor to the pool of unskilled and low-skilled workers, rather than as agricultural labor.¹¹³ Thus, the agricultural productivity 'shock' triggers a movement of labor out of agriculture into the secondary and tertiary sectors.

The movement of labor out of agriculture can accelerate structural transformation. The agricultural labor share in the productivity improvement scenario is 0.8 percentage points lower by the year 2030 than in the reference scenario (Figure 86). This reduction is driven by all regions, apart from the western region, as it retains more agricultural workers than in the reference scenario, in the face of the largest yield increases and thus the largest income effect (Figure 93).

¹¹³ Part of the workforce is also absorbed by non-crop-producing agricultural sectors, such as in livestock and forestry production.



Box 8: A description of the CGE modeling approach

The results shown in this Chapter are derived from a recursive dynamic variant of the STAGE single-country CGE model¹¹⁴. The model is a member of the class of single country CGE models that are descendants of the approach to CGE modeling described by Dervis et al., (1982)¹¹⁵. The model is centered around a SAM that identifies the agents in the economy and provides the transactions database with which the model is calibrated. It differentiates between different sectors and five regions (central, eastern, western, south-eastern, and south-western (see definition above).

In this Chapter, the model is first used to explore agricultural productivity improvements and then also used to assess the impact of climate change (see section 2.4). It does so through a total of three policy scenarios and a reference baseline scenario. Each scenario spans an 11-year period from 2019 (the base year of the SAM) to 2030. Outcomes under each scenario are compared to a reference scenario, which corresponds to the hydro-led growth scenario discussed in module 1 of this CEM.

The considered scenarios are the following:

Reference Scenario (A1_HydroLed): This scenario includes the continuation of past trends and current policies in place, plus the construction and commissioning of four planned hydropower projects: Punatsangchhu I, Punatsangchhu II, Nikachhu, and Kholongchhu. The additional planned investment results in an expansion in hydro capacity and production after 2023/2025. No additional projects are planned after 2025.

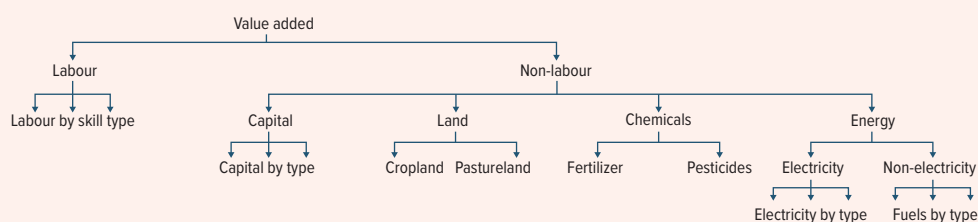
Productivity Improvement Scenario (A2_HydroLed_Prod_LabSav): In this scenario, the reference scenario is augmented by adding labor-saving productivity improvements in agriculture. A comparison of this scenario with the reference scenario shows the impact of crop- and region-specific productivity improvements in crop-based agriculture that release labor to other sectors of the economy.

Climate Change Scenario (A3_HydroLed_CC): This scenario augments the yields in the reference scenario by including climate-induced yield changes. A comparison of this scenario with the reference scenario shows the impact of crop specific climate change impacts on land productivity.

Combined Scenario (A4_HydroLed_Prod_CC): As scenario 1, but with productivity improvements in agriculture and climate change impacts. A comparison of this scenario with the reference scenario shows the impact of the productivity improvements and climate change together. A comparison of this scenario with the productivity improvement scenario shows the augmenting/dampening effects of climate change on yield changes from agricultural productivity improvements.

The production structure of the model is designed to capture labor-saving productivity improvements in agriculture. The production structure places labor as a substitute to aggregate non-labor factors (Figure 84). Under an elastic degree of substitution (5) between the labor and non-labor input aggregates in crop production improvements in the productivity of non-labor factors leads producers to move away from less productive labor inputs, towards more productive non-labor inputs, leading to labor shedding from these sectors. Conversely, reductions in land productivity, such as those that may arise under climate change, will increase the use of other non-labor and labor factors in the production process.

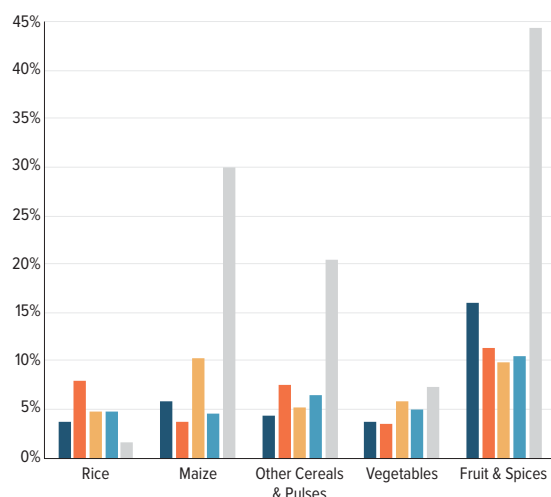
Figure 82: Production structure for labor saving productivity improvements



114 McDonald, S. 2022. "STAGE: A Standard Applied General Equilibrium Model: Technical Documentation".

115 Dervis, K., De Melo, J. and Robinson, S. 1982. "General Equilibrium Models for Development Policy". Cambridge University Press.

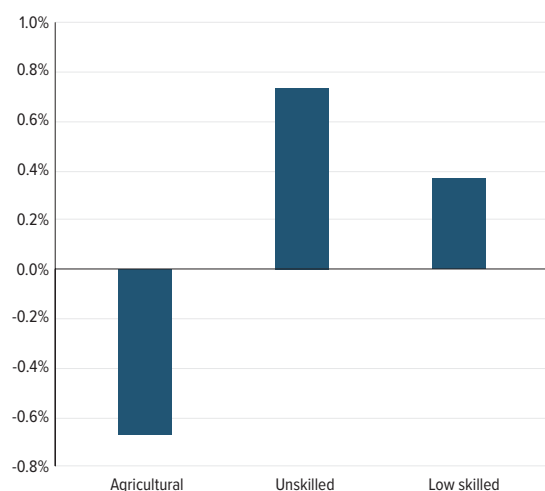
Figure 83: Closing 20 percent of the existing yield gaps by augmenting non-labor production inputs...



Source: Shutes, Feuerbacher, and McDonald. 2022. CEM Background Paper.

Note: Both figures show outcomes in the year 2030 and compare outcomes between the agricultural productivity and the reference scenarios.

Figure 85:...and induces a shift of labor out of agriculture...



Source: Shutes, Feuerbacher, and McDonald. 2022. CEM Background Paper.

Note: Both figures show outcomes in the year 2030 and compare outcomes between the agricultural productivity and the reference scenarios.

Figure 84: ...raises relative wages of non-agricultural workers...

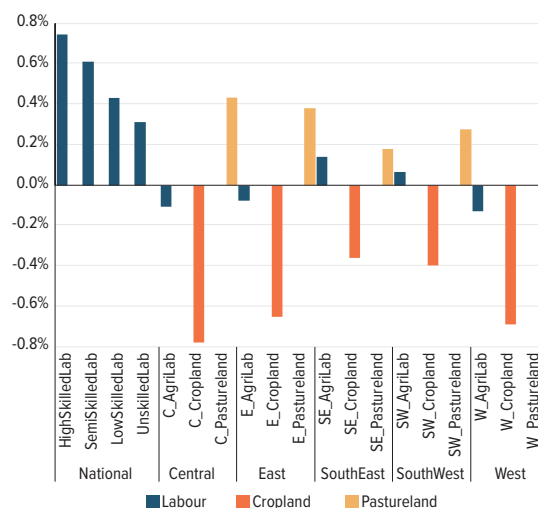
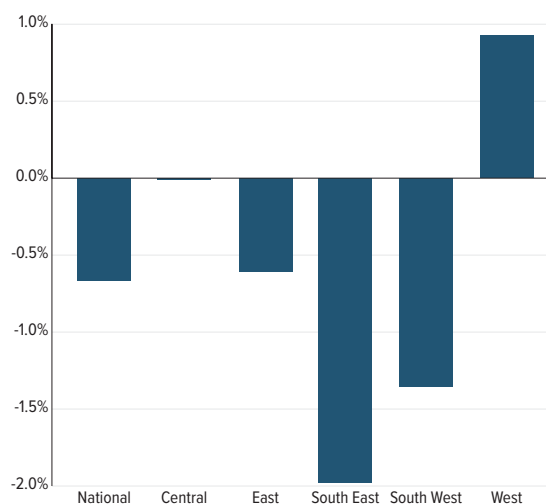


Figure 86: ...which accelerates structural transformation, especially in the southern part.



The impact of agricultural productivity improvement on GDP is modest. The introduction of labor-saving productivity improvement in crop-based agriculture leads to a small headline impact on GDP of 0.4 percent by 2030 (Figure 88), which is in line with the small initial share of crop production in total output (6 percent in 2019). The impact on domestic demand (consumption and investment, or absorption) is larger at 1.6 percent, consistent with the boost to a part of the economy that is largely consumed domestically (only 11 percent of crop production was exported in 2019).

In contrast to the modest headline figures, increasing agricultural productivity can cross-fertilize growth in the service sector. Service GDP is almost 1 percent higher under the agricultural productivity scenario in comparison to the reference scenario (Figure 90). The impacts outside agriculture arise from the increased availability of low-skilled labor and an increase in household spending arising from lower food costs (Figure 87), as well as higher non-agricultural



wages. Within services, almost all sectors expand, with the strongest growth estimated in the air and transport, and telecommunications sectors. The hotels and restaurants sector also benefited from the direct effect of lower crop prices as it accounted for 20 percent of total intermediate demand for crops in 2019, and used 34 percent of all vegetables and 71 percent of all fruits and spices.

Figure 87: Higher agricultural productivity reduces crop prices...

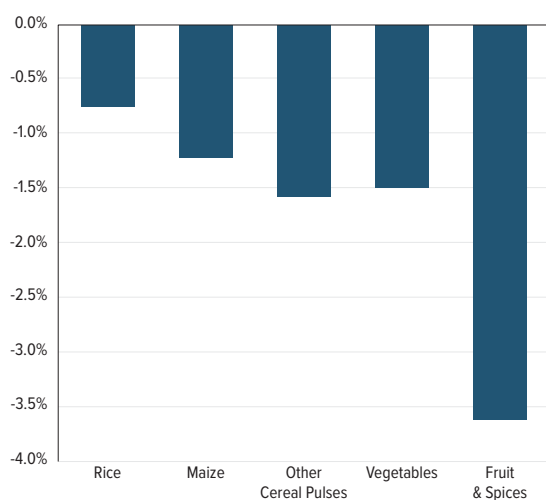
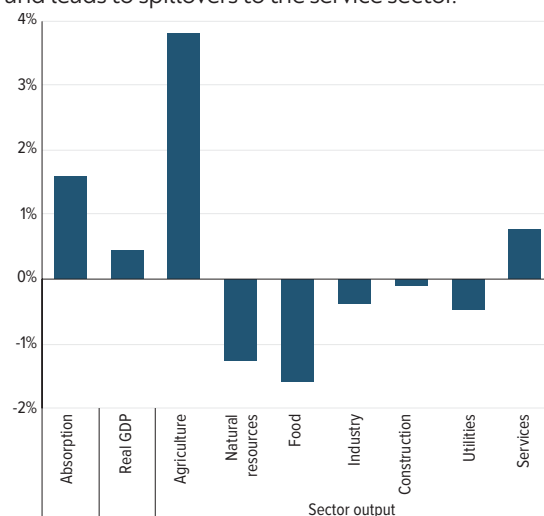


Figure 88:...which generates an income effect that augments the direct impact of productivity increases and leads to spillovers to the service sector.



Source: Shutes, Feuerbacher, and McDonald. 2022. CEM Background Paper.

Note: Absorption comprises domestic private and public consumption and investment. Both figures show outcomes in the year 2030 and compare outcomes between the agricultural productivity and the reference scenarios.

The CGE analysis shows that a closure of agricultural productivity gaps can contribute to structural transformation and generate spillovers to non-primary sectors. Labor-saving crop productivity improvements lead to growth in the agricultural and service sectors, via the direct effect of lower food prices and indirect effect on wages, both of which increase household consumption, which, in turn, stimulates services demand. The structural transformation effect of labor mobility augments the boom in the service sector.

2.4. Climate change may increase agricultural output but also lead to yield variability

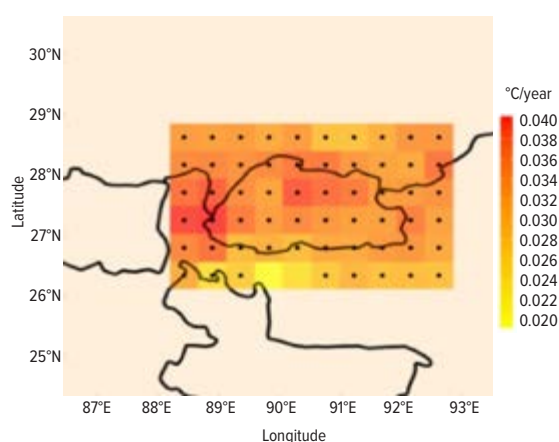
This section considers the effect of climate change on yields in Bhutan and the associated macroeconomic impact. The section begins by briefly summarizing the past and future impacts of climate change on temperatures and precipitation in Bhutan. It then uses estimates from global climate models developed by the FAO to estimate the impact of future climatic changes on yields by crops and geographic regions. These estimates are then fed into the CGE model, described in section 2.3.4, to understand how climate-induced agricultural output changes will affect Bhutan's broader economy.

2.4.1. Climate change is expected to raise both temperatures and precipitation levels

Over the last 70 years, average temperatures in Bhutan have increased at an accelerated pace. Mean temperatures in Bhutan increased by 1.4 degrees Celsius between 1951 and 2020, an average pace of 0.2 degrees per decade. The speed of heating has accelerated in recent years, with mean temperatures rising by 0.3 degrees per decade between 1991 and 2020. The increase has occurred across the temperature distribution, with minimum temperatures also rising (Figure 89).

The rise in temperatures was accompanied by changing precipitation patterns. While annual average precipitation has not changed significantly over the last three decades, the average effect masks a changing composition of precipitation patterns across regions and an increased divergence between the northern and southern parts of the country. The northern parts of Bhutan, traditionally the driest, have experienced annual declines of between 5 and 10 millimeters of rainfall per year, making them even drier. In contrast, rainfall in the wetter southern parts has increased by up to 10 millimeters per year (Figure 90). Seasonality has also increased over the same period, with pre-monsoon and monsoon periods (April to September) experiencing more rainfall, with little changes in the other months.

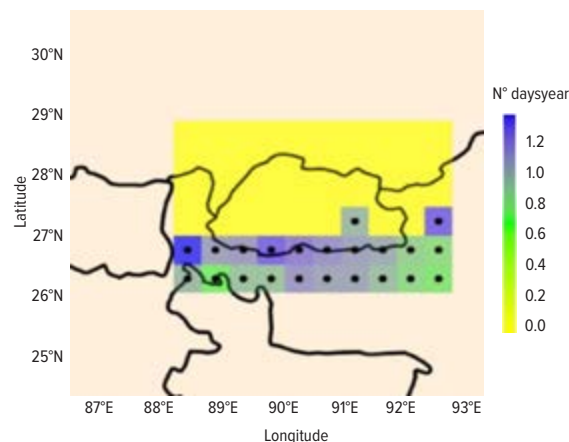
Figure 89: Minimum temperatures have increased significantly across Bhutan over the last three decades...



Source: Food and Agriculture Organization of the United Nations. 2022.

Note: The left figure shows the yearly change in minimum temperatures between 1981 and 2010. Changes that are statistically significantly different from zero are marked by a black dot. The right figure shows yearly changes in heavy rainfall conditions (precipitation $\geq 20\text{mm/day}$) over the 1981 to 2010 period, with statistically significant changes marked by a red dot.

Figure 90: ...and rainfall has become more variable and extreme in the southern parts of the country.



Going forward, climate models predict rising temperatures and more irregular precipitation patterns. Between 2021 and 2099, mean temperatures are expected to increase by a further 1.2 degrees under a low climate change scenario (RCP2.6)¹¹⁶, 2.4 degrees under an intermediate scenario (RCP4.5), and 4.5 degrees under the most extreme scenario (RCP8.5).¹¹⁷ These values exceed the global average temperature increases. Similar increases are expected for minimum temperatures (Figure 91). Rainfall is expected to increase by between 10 and 30 percent per year overall, particularly during the pre-monsoon and monsoon months (Figure 92). Most of the precipitation increase is projected to affect the lowlands and the south-eastern parts of Bhutan. Concurrently, the number of dry days is also expected to increase, which implies that heavy precipitation events are likely to become more frequent. These are especially likely to affect the south-western parts of the country.¹¹⁸

Extreme temperature and weather events are also expected to become more frequent. The temperature and precipitation projections highlight that the frequency and intensity of extreme weather events is likely to increase going forward. Higher rainfall will increase the potential for flash floods, landslides, and soil erosion. Extreme heat events are likely to affect Bhutan's lowlands. For instance, the number of tropical nights, defined as nights where the minimum temperature does not dip below 20 degrees, are expected to increase by 20 to 30 days per year by the end of the century for the country, and by 70 to 90 days in the lowlands when compared with a 1981 to 2005 baseline.

¹¹⁶ RCP8.5 is the highest emissions pathway in the Intergovernmental Panel on Climate Change (IPCC) baseline, associated with the most severe climate impacts. In comparison, RCP2.6 is consistent with a global mean temperature increase of up to 2°C.

¹¹⁷ Source: Coupled Model Inter-comparison Project Phase 5 (CMIP5) models, which are utilized within the Fifth Assessment Report (AR5) of the IPCC, providing estimates of future temperature and precipitation, are provided by the World Bank Group and the Asian Development Bank (2021), Climate Risk Country Profile: Bhutan (2021).

¹¹⁸ These and other estimates presented in this section are based on a background paper prepared for this report. See Alvar Beltrán, J., Soldan, R., and Franceschini, L. 2022. "Climate Risk Assessment. Climate Impacts in Bhutan's Agroecological Zones and Opportunities for Climate Smart Agriculture Practices". Food and Agriculture Organization.

Figure 91: Going forward, minimum temperatures are expected to continue to increase...

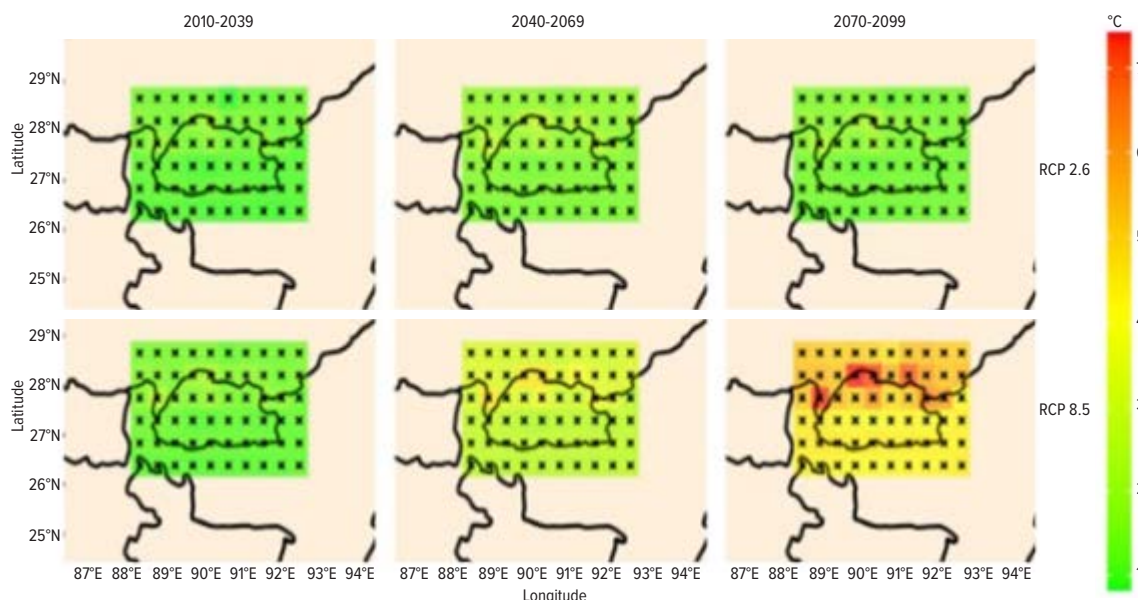
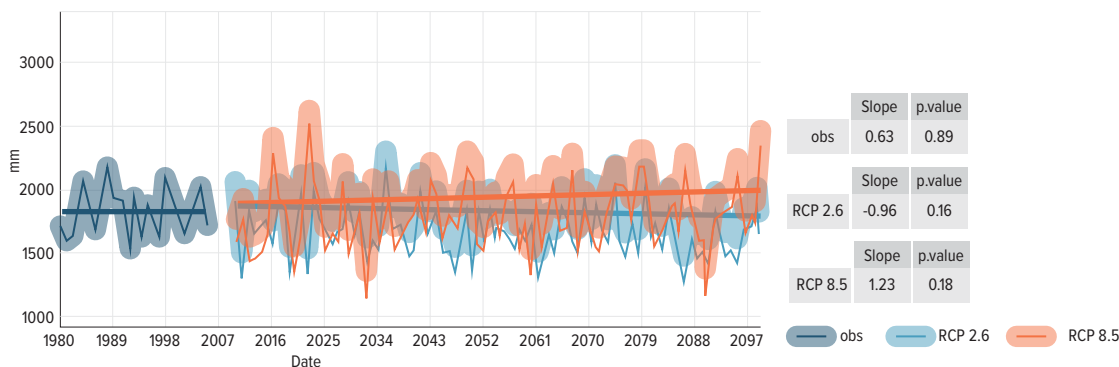


Figure 92: ...and rainfall variability will increase with climate change severity.



Source: Food and Agriculture Organization of the United Nations. 2022.

Note: The left figure shows projected changes in mean minimum temperatures in comparison to the historical reference period (1981-2010). The analysis differentiates by (i) projection horizon, and (ii) climate change severity. The black dot indicates whether at least 60 percent of the calculated models agree in the sign of the climate change signal (positive or negative). The right figure shows the path of inter-annual rainfall variability over the 21st century.

2.4.2. The impacts of climate change are expected to alter Bhutan's yield structure

The developments induced by climate change are expected to impact the agricultural sector both on the intensive and the extensive margins. On the intensive margin, yields, especially in rainfed production systems, are expected to be adversely affected by the impacts of increased heat and more erratic rainfalls on, among others, agricultural water availability, crop losses due to flash floods, and the emergence of new diseases. This impact will be exacerbated by the absence of widespread irrigation facilities to modulate rainfall and temperature variability.

On the extensive margin, land in higher altitudes may become suitable for crop production. While production in the southern lowlands of Bhutan is likely to suffer from climate change, land in higher altitudes may become suitable for crop production due to more adequate temperatures and increased rainfall. In the case of rice, for instance, land suitability is expected to increase by 10 percent by 2050, subject to land being cleared and available for cultivation.

Model estimates highlight that climate change will affect the yields of maize and rice in a non-linear fashion.¹¹⁹ The yield projections for both crops depend on the severity of climate change. Under a moderate RCP2.6 climate change scenario, rainfed maize yields are expected to increase over the next century and exceed the 2021 level by 4.4 percent (Figure 93). In contrast, more severe climate change (RCP8.5) would induce a short-term yield boom, increasing rainfed yields by 7 percent over the next decade, but a longer-term yield decline below the 2021 level at the end of the century. Rainfed rice yields are expected to decrease systematically, falling below their 2021 level by 2.1 and 21.3 percent by 2099, under RCP2.6 and RCP8.5, respectively. In contrast, irrigated rice is significantly less sensitive to climate change severity and yields are expected to remain close to 2021 levels over the forecast horizon.

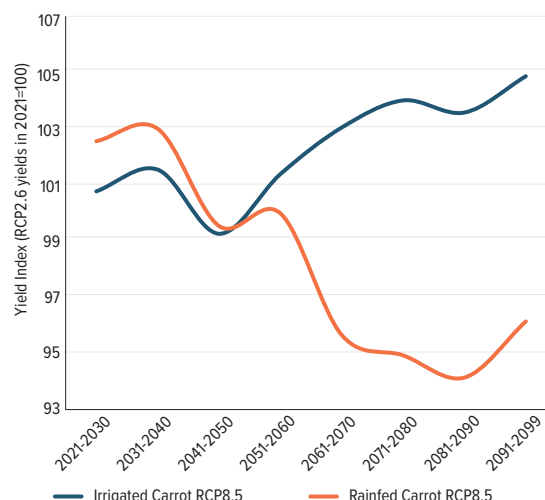
More generally, a failure to contain climate change will benefit rainfed yields initially, but will lead to a longer-term yield decline compared with a more moderate climate change scenario. By 2099, rainfed rice and maize yields are projected to be 15 and 7 percent lower under RCP8.5 than under RCP2.6, respectively (Figure 97). This trend, however, masks some non-linearity, with these yields benefiting from higher rainfall and increased temperatures associated with more climate change until 2040 or, in the case of rainfed rice, mid-century, and then consistently falling short of yields under RCP2.6.

Figure 93: Yields for rainfed maize are projected to increase going forward, but that increase will be temporary if more severe climate change materializes.



Source: Food and Agriculture Organization of the United Nations. 2022.
Note: All projections are drawn from the MPI-M-MPI-ESM-LR model.

Figure 94: Irrigation of vegetables, such as carrots, is key to turning climate change into an opportunity.



The irrigation status of crops is a key determinant of yield trajectories until the end of the century. The example of carrots – one of the exportable vegetables identified in section 2.2.4 – illustrates this (Figure 94). Under the RCP8.5 scenario, rainfed yields are expected to plummet by mid-century and remain 4 percent below their 2021 level by 2099. In contrast, irrigated carrot yields avoid this decline and are projected to exceed 2021 levels by 5 percent by the end of the century.

¹¹⁹ As part of a background paper for this report, the Food and Agriculture Organization of the United Nations applied an agro-ecological zoning tool on an eco-physiological model to estimate climate change impacts on crop yields for rainfed and irrigated conditions. The approach follows Kassam, A.H. 1977. "Net Biomass Production and Yield of Crops". FAO, Rome, and Kassam, A.H., et al. 1991. "Agroecological Land Resources Assessment for Agricultural Development Planning". World Soil Resources Reports (7/1 vol. 1-8) FAO/IIASA, Rome; summarized in Alvar Beltrán, J., Soldan, R., and Franceschini, L. 2022. "Climate Risk Assessment: Climate Impacts in Bhutan's Agroecological Zones and Opportunities for Climate Smart Agriculture Practices". FAO, Rome, Italy. 2].



Transitioning from rainfed to irrigated production methods provides a unique opportunity for Bhutan to safeguard against the adverse impacts of climate change on agriculture. For instance, under irrigated conditions, maize yields are expected to increase over the projection period in comparison with historic values and between RCP8.5 and RCP2.6. Specifically, by 2099, irrigated maize yields under RCP8.5 are projected to exceed yields under RCP2.6 by 2.8 percent. This will be driven by (i) closer to optimal temperatures at pollination, and (ii) a decrease in frost stress conditions at the early stages of crop development. Also, considering that irrigated yields exceed rainfed yields by 20 percent on average, the difference in climate impacts between rainfed and irrigated production systems highlights the importance of irrigation in adapting agricultural production to climate impacts. Since irrigation for crops, other than for rice, is virtually absent in Bhutan today, this analysis highlights that addressing this key constraint will make agriculture more resilient to the effects of climate change.

The yields of select vegetables are expected to increase as climate change makes climatic conditions more favorable to their production, even under rainfed conditions, thereby opening an export opportunity for Bhutan. Cabbage and white potato yields are projected to benefit substantially from climate-induced temperature and precipitation changes. Rainfed cabbage yields, for instance, are expected to exceed 2021 levels by 5 and 13 percent at the end of the century under RCP2.6 and RCP8.5, respectively. These increases outweigh the expected yield growth even under irrigated conditions. In addition, more severe climate change is expected to benefit cabbage yields, with 2099 RCP8.5 yields exceeding RCP2.6 yields by 8 and 10 percent, respectively (Figure 95, Figure 96).

Figure 95: More severe climate change is expected to temporarily benefit maize and rice yields under rainfed conditions, but cause a deterioration in the longerrun...

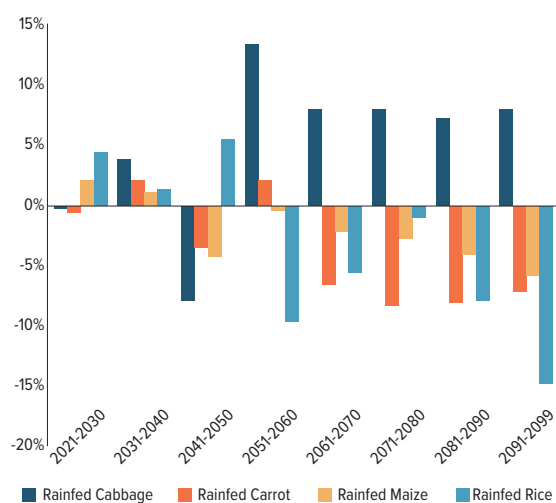
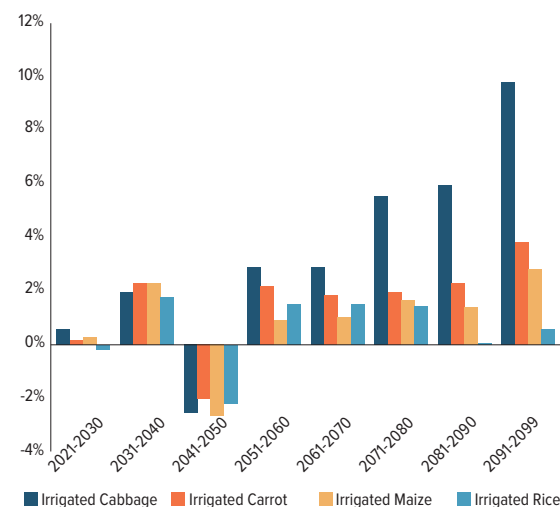


Figure 96: ...whereas yields under irrigated conditions are expected to systematically benefit from more severe climate change.



Source: Food and Agriculture Organization of the United Nations. 2022.

Note: The left figure shows impacts under rainfed conditions, whereas the right figure shows impacts under irrigated conditions. All projections are drawn from the MPI-M-MPI-ESM-LR model.

The increase in select crop yields is consistent with predictions made by other models in the literature. The International Center for Tropical Agriculture (CIAT, 2017), by applying the International Model for Policy Analysis of Agricultural Commodities and Trade model to assess climate impacts on agricultural commodities for a climate and non-climate scenario,¹²⁰ finds that almost all crop yields are expected to increase between 2020 and 2050, and that yield increases under climate change are likely to be higher than under no climate change conditions. Under this model, higher temperatures could increase the yields of fruits (apples), tropical fruits (oranges), rice, vegetables (cardamom and chili), and potato by 0.8, 6.2, 0.9, 4.9 and 5.0 percent, respectively, compared to a non-climate change scenario. The only exception in this paper is maize yields, which are projected to decrease by about 10 percent by 2050.

120 CIAT and World Bank. 2017. "Climate-Smart Agriculture in Bhutan". CSA Country Profiles for Asia Series. Washington, D.C.

Heat stress, dry spells and extreme rainfall are also expected to impact agricultural production. The estimates provided by the model incorporate the impact of extreme events on projected crop yields. Extreme events have a higher predictive power under RCP8.5 than under RCP2.6, consistent with a higher expected frequency and severity of extreme events. The most common projected climate hazard is heat stress, followed by dry spells. Although wet days affect a small proportion of crops, their impact is particularly high under RCP 8.5. These results suggest that irregular rainfall patterns, which combine heavy rain with subsequent dry spells, are most likely to affect crop yields under RCP 8.5.

There are additional adverse impacts of climate change, which the model projections are unable to capture. Water shortages are expected to arise not because of an absence of water – Bhutan has the highest per capita availability of water in the world – but because of its unequal distribution between seasons and locations, as well as a lack of comprehensive and efficient irrigation infrastructure. This will be exacerbated by a reduction of snowmelt water in the spring, which currently provides an important water source for irrigation. Risks of soil erosion arise because of steep terrain and anticipated extreme rainfall, and could damage soil fertility, irrigation schemes, and market-access roads. A warmer climate could also lead to more and different type of pests and diseases. For instance, leeches, which previously predominated in warmer areas, are now found in cooler regions. Potato tuber moths, a common pest in the lower subtropical region, are increasingly found at higher elevations, and the caterpillar fungus is disappearing at elevations below 3000 meters.

The projected climate impact emphasize three aspects for adaptation policy to consider. First, an expansion of irrigation is crucial, as irrigated crop yields are less volatile over the century and less susceptible to more severe temperature and precipitation changes. Second, climate change has the potential to open production and export possibilities in select vegetables, such as cabbage, from about mid-century. Acknowledgement of this fact ahead of time will allow Bhutan to establish the necessary infrastructure and support facilities for farmers to benefit from this opportunity. Third, the yield changes associated with climate change can be deceptive. For instance, rainfed maize yields may increase temporarily, which may distract from necessary investments to benefit from longer-term yield gains from vegetables. The next section illustrates the latter point by using a modeling approach.

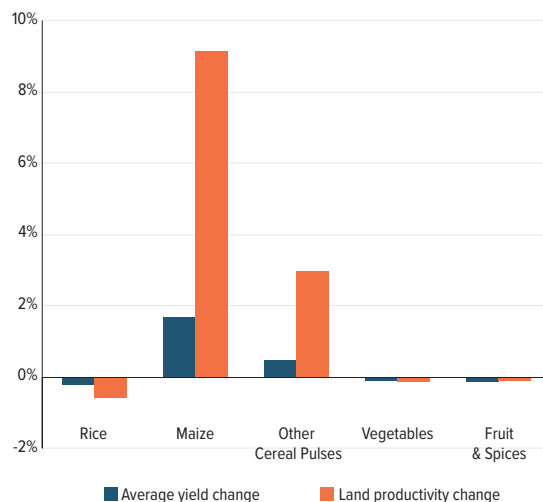
2.4.3. Short-term climate-induced yield changes can temporarily increase output, but risk distracting from longer-term diversification opportunities

This section uses the CGE model, described in section 2.3.4, to evaluate the medium-term macroeconomic implications of the yield changes associated with more extreme climate change. The impact of more extreme climate change on agricultural yields is calculated as the average difference in yields under RCP8.5 and RCP2.6 from 2019 to 2030, using the same data source as the previous section. As such, RCP2.6 is taken as a reference scenario against which the additional change in yields from more extreme climate change is identified. The estimates include both systemic climate change and stochastic occurrences of localized natural disasters. The CGE model is only calibrated until 2030, as it relies on underlying macroeconomic projections. As such, it can only evaluate the impact of climate change in the medium term, which, as discussed in the previous section, differs from its longer-term impacts.

The scenario models climate change as a shock to land productivity, which is calibrated to match the yield differences between RCP8.5 and RCP2.6. The impact of more extreme climate change on yields is shown in Figure 97, which, consistent with the practice in Bhutan, assumes that paddy is irrigated, and all other crops are rainfed. The estimates show that more severe climate change is expected to increase rainfed maize and other cereal and pulse yields by 2030, whereas yields are expected to decline for (irrigated) rice, vegetables, fruits, and spices, compared to a less serious climate scenario.

This simulation only considers a partial impact of climate change, operating through agricultural production. Other possible climate change impacts, such as reduced labor productivity of outdoor workers under higher average temperatures and the loss of infrastructure assets, are not considered. The simulation also does not model the aggregate macroeconomic impact of large-scale disasters, such as glacial outburst floods, to which Bhutan is vulnerable.

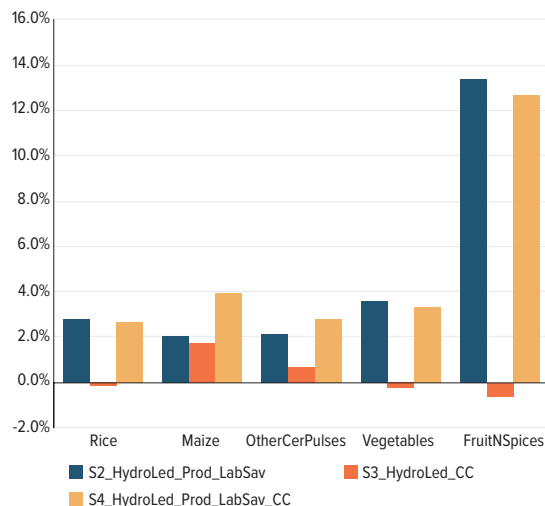
Figure 97: A short-term climate-induced increase in maize and cereal yields...



Source: Shutes, Feuerbacher, and McDonald. 2022. CEM Background Paper.

Note: Both figures show outcomes for the year 2030 and compare outcomes between the agricultural productivity and the reference scenarios.

Figure 98: ...induces a modest production shift towards these crops.



Climate-induced yield changes affect relative prices and production in equilibrium, counteracting Bhutan's recent trend towards export-oriented crops. The model shows that crops for which yields improve under climate change see a fall in prices (maize, other cereals, and pulses), while prices increase for those crops for which yields fall (rice, vegetables, fruits, and spices). These price changes increase the output of maize, cereals and pulses and reduce the production of other crops (Figure 98). Climate change thus induces a shift back towards Bhutan's traditional rainfed mainstay – maize – at the expense of crops that are expected to experience stronger yield increases later in the century (vegetables, including cabbage).

The yield improvements brought about by climate change do not induce a labor movement effect, as observed for the productivity improvement scenario. With price increases for some goods offsetting price decreases for other goods, climate-induced yield changes do not affect relative wages (Figure 99). As a result, more severe climate change – even though it seems to increase some yields and land productivity on the surface – results in much smaller labor mobility effects than the broader agricultural productivity improvements discussed in section 2.3.4, that is, more severe climate changes reduce the agricultural labor supply by 0.1 percent, compared to the 0.7 percent reduction in response to input productivity improvements.

Consequently, even though climate change increases some yields in the short term, these do not increase demand and thus do not generate spillovers to non-agricultural sectors. Despite the increase in agricultural productivity for some crops, the expansion in the services sector, as observed in the scenario on agricultural productivity improvements, is absent in the climate change scenario. This is because household expenditure increases by only 0.1 percent compared to the reference scenario in response to the climate-induced yield changes, compared to a 5 percent increase observed in response to agricultural productivity increases. The exception to this is the food sector, which uses maize, cereals, and pulses as inputs and benefits from lower prices, but does not receive a growth stimulus through higher demand.

Considering these countervailing forces, the headline impact of climate-induced yield changes on output is modest. The model highlights that the effect of more extreme climate change on agricultural production will primarily impact the economy via lower prices of maize, which will reduce food prices and stimulate agricultural and food sector output. This, in turn, will filter through to a small increase in domestic consumption, investment, and GDP (Figure 100).

Therefore, the model, illustrates the deceptive nature of climate-induced yield changes. While climate change may increase some yields and enable production in more mountainous and drier areas, its benefits need to be appreciated cautiously. First, as highlighted by the model, the superficial yield changes generate little macroeconomic spillovers.

Second, unless longer-term expectations on yield changes are considered when making investment decisions, there is a risk that short-term yield and output increases of rainfed maize may attract investments to this crop and distract from longer-term adaptation needs.

Figure 99: Lower maize and cereal prices are partially offset by higher prices of crops whose yields decrease, thus leaving wages almost unaffected...

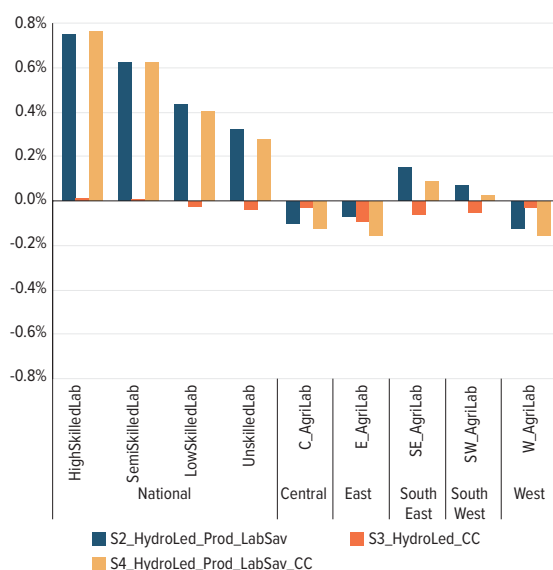
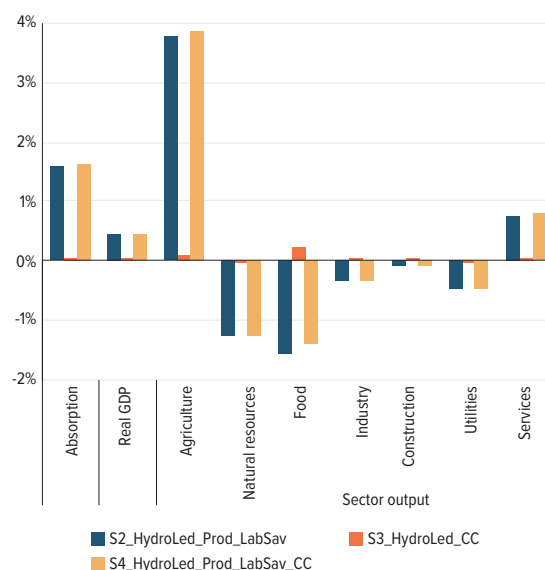


Figure 100:...and generating practically no spillovers to the non-agricultural sector.



Source: Shutes, Feuerbacher, and McDonald. 2022. CEM Background Paper. Note: Both figures show outcomes in the year 2030 and compare outcomes between the agricultural productivity and the reference scenario.

2.5. Policy priorities

This Chapter has argued that slow agricultural productivity growth is a constraint to structural transformation. Even though progress has been slow, this Chapter has documented that productivity pockets are emerging and Bhutan has started exploiting its comparative advantages. However, climate change poses a risk to this transition, as it will temporarily alter economic incentives towards the production of traditional crops.

The findings lead to three principles that agricultural policy can follow to stimulate growth:

- As structural transformation progresses, agricultural labor shortages will increase because people will gravitate towards industrial and service centers. The goal of the growth policy is to facilitate this movement, while enabling investments in technology to compensate for the labor loss.
- To support the transition towards Bhutan's comparative advantages and enable the country to benefit from crops whose yields will increase with climate change in the longer run, it is crucial to avoid investments in traditional rainfed crops with limited growth prospects.
- Investing and enabling private investment in irrigation is central to increasing yields, adapting to climate change, and enhancing structural transformation.



This section discusses ideas for public policy options that can support agricultural productivity growth. These are grouped into three complementary approaches: (i) strategic infrastructure investments, (ii) policy reforms that will facilitate private investments, as well as access to technology and production inputs, and (iii) targeted support to farmers.

2.5.1. Strategic infrastructure investments

The most important investment in agricultural productivity that Bhutan can make is in developing irrigation infrastructure. As documented in this chapter, irrigated yields exceed those of rainfed crops; irrigation can help overcome water shortages and directly increase yields. In contrast to rainfed yields, irrigated yields are likely to be positively affected by climate change, providing a unique opportunity for Bhutan to adapt to changing temperature and precipitation patterns.

Despite its significance, irrigation infrastructure in Bhutan is underdeveloped and public investment in it is lacking. Irrigation investments are often highlighted as a policy priority by authorities. For instance, the 12th and the 13th Five Year Plans (FYPs) identified water scarcity as a priority area to be addressed to improve agriculture productivity. Despite these commitments, public investments in agriculture have been modest. As of May 2018, the Government had planned at least 14 schemes for irrigation development that are on hold due to a shortfall in the availability of funds. In the absence of public investments, farmers have been relying on small-scale and traditional practices, such as, about 1,000 functional community-managed irrigation systems.

Public investment is constrained by an institutional fractionalization between the central and subnational governments. Bhutan devolved certain irrigation-related activities to the dzongkhag level as part of the 9th FYP in 2002. This resulted in a loss of irrigation development capacity, as expert staff was not devolved together with the expenditure responsibilities. As a result, local capacity to plan any major irrigation works is limited.¹²¹ Instead of delegating specialized staff, centrally employed irrigation engineers and professionals were reassigned to other infrastructure development departments, such as roads and building construction, as the central department of agriculture no longer maintains a focused irrigation division.¹²²

Bhutan does not only lack in irrigation infrastructure, it struggles to maintain the existing facilities. It is estimated that 20 percent of irrigation facilities are inoperable due to technical problems, 18 percent due to social issues, and 8 percent due to problems with the water source. The inadequate knowledge and lack of experience of district-level engineers in irrigation planning, design, building, and maintenance are major contributors to their inability to maintain facilities and, in some cases, identify the root cause of dysfunction.¹²³

The design of current irrigation schemes can potentially be improved for efficiency and climate resilience. Currently, most irrigation systems are open-earth systems with low efficiency and little resilience to extreme events. This leads to blockages, water loss through seepage, and water conveyance loss, which can cause high percolation of water through the soil and lead to erosion and landslides downstream. Outdated irrigation infrastructure is a bigger cause of land degradation than sustainable and resilient productivity increases.

Water availability is not a crucial constraint compared to investment, maintenance, and design. An assessment of water availability through surface runoff showed that it was not a constraint for irrigation development. According to this analysis, 71 percent of the present systems can be upgraded for increasing irrigated areas and/or cropping intensities, and the remaining systems (29 percent) can only be updated through the diversification of water sources. Using observed meteorological data from Class A weather stations, the assessments also suggest that the availability of 80 percent dependable water at the level of a district will not be a constraint for developing new irrigation systems.¹²⁴

121 AED. 2018. Irrigation Section Report, Department of Agriculture, Bhutan. Also, Dizon, F., et al. 2019. "Bhutan Policy Note: Harnessing Spatial Opportunities in Agriculture for Economic Transformation". World Bank, Washington, D.C.

122 AED2018. Irrigation Section Report, Department of Agriculture, Bhutan.

123 Dizon, F., et al. 2019. "Bhutan Policy Note: Harnessing Spatial Opportunities in Agriculture for Economic Transformation". World Bank, Washington, D.C.

124 Agriculture Engineering Division. 2018. Irrigation Section Report, Department of Agriculture, Bhutan.

In addition to infrastructure investments, rural roads are also critical to enable a reorientation of the agricultural sector towards its comparative advantages. This chapter has argued that transport logistics are a challenge to an export-oriented agricultural sector. As an increasing share of Bhutan's agricultural output is exported, these constraints will likely become more binding. Despite the importance of rural connectivity, rural roads are mostly unpaved, not resilient to extreme rainfall during intense monsoon seasons or extreme events, and increasingly impassable after landslides. These challenges will be exacerbated by climate change.

Priority actions to overcome these constraints include the following:

- ▶ **Instituting a multi-year, centrally funded, irrigation investment program:** This program can either be centrally administered or instituted through the combination of a conditional grant to dzongkhags and capacity building for subnational implementation. The program should support components involving (i) the construction of new irrigation facilities to increase the irrigated area; (ii) climate-proofing of new and existing irrigation infrastructure through, for instance, lining and concreting of earthen irrigation canal sections, mitigation of slope instability and slope failure, and the use of pipes to enhance functionality; and (iii) the rehabilitation of existing schemes.
- ▶ **Transferring irrigation planning and management capacity to dzongkhags:** Departments responsible for irrigation maintenance and investments need to be equipped with the necessary skills and manpower to undertake detailed assessments, plan and implement climate-proof irrigation systems, and engage in water resource management and planning. Building this capacity could require a two-pronged approach. On the one hand, the Central Government can institute a staff rotation program that delegates specialized engineers to dzongkhags. On the other hand, dzongkhags could benefit from targeted staff training programs that build missing capacity.
- ▶ **Investing in the climate-proofing of roads:** This could involve investments in slope stabilization, drainage, and culverts. Investments should be combined with a strategic assessment, which identifies roads that are in poor condition and roads that lead to high potential agricultural areas.

2.5.2. Policy reforms

Attracting additional FDI to agriculture can help boost productivity growth. FDI does not only provide farms with capital needed for investment, it is also frequently associated with technology transfers, which can help agricultural producers make better use of their resources and land. Despite these benefits, Bhutan only attracts a limited level of FDI to the sector.¹²⁵ While Bhutan has made significant progress in the liberalization of its FDI regime, more can be done to reduce regulatory hurdles. Although Bhutan has included agro-processing – including horticulture – as a priority activity in its FDI policy, investment in this sector is still subject to a BTN 20 million minimum project cost (approximately US\$240,000) and a 74 percent cap on foreign ownership. This precludes investment into smaller-scale and niche farming operations with potential for high growth. The cap on foreign ownership can also pose investment challenges if finding a local partner proves difficult. These regulatory burdens are compounded by challenges in obtaining (cost-efficient) business visas to explore investment opportunities.

Marketing Bhutan's unique global brand can also help attract investments and promote agricultural exports. Bhutan is known globally for its focus on happiness, sustainable natural resource use, and carbon neutrality. This global brand is a central asset at the country's disposal. Despite its value, Bhutan has done little up until now to tap into global export markets using these strengths.

There are opportunities to enhance efficiency through competition in the agricultural input industries. Bhutan does not levy import duties on most agricultural inputs, such as seeds and fertilizers. This ensures that farmers can access these inputs at competitive prices from abroad. Domestically, however, input industries are predominantly owned by the public sector, which limits competition and incentives for innovative firms to enter the market and for foreign investors to help foster the growth of the sector.

¹²⁵ World Bank Group. 2017. "Increasing Agribusiness Growth in Bhutan". World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/28538> License: CC BY 3.0 IGO."



Land designation changes and the expansion of irrigation also face regulatory policy constraints. Land use is regulated by the Land Act of Bhutan (2007), which imposes some restrictions that can hamper the transformation of the agricultural sector. Specifically, the Act imposes regulatory restrictions on the conversion of chhuzhing (paddy land) to other uses. It also limits the use of irrigation to chhuzhing, excluding kamzhing (the type of land on which maize and other rainfed crops are grown).

A careful balance is required between Bhutan's ambition to promote organic agriculture and its focus on growth. Bhutan is ambitious to become the first country to exclusively produce organic agricultural products. However, evidence suggests that organic crop yields are 24 percent lower than conventional yields and a full transition to organic agriculture could considerably reduce GDP.¹²⁶

Priority actions to reform the policy environment include the following:

- ▶ **Easing regulatory hurdles for FDI:** To attract more FDI, Bhutan could consider eliminating the foreign ownership cap and further reducing the minimum investment threshold. It could also consider providing free visas to prospective investors.
- ▶ **Initiating a more aggressive investment and export promotion activity:** Branding Bhutanese agricultural products with the country's focus on environmental conservation and sustainable development can stimulate global demand and help attract investment for their production. Realizing this opportunity depends on the establishment of a dedicated investment promotion agency, which can initiate marketing campaigns and identify and approach prospective investors directly. This kind of export promotion will also be crucial for successfully implementing a transition towards more organic agriculture, as it would yield losses to be compensated by price premiums in international markets.
- ▶ **Stimulating domestic input competition:** Bhutan passed a new National Competition Policy in 2020, which now needs to be operationalized. As part of this operationalization, the competition administration could critically evaluate the role of SOEs in the agricultural input value chain and determine options to enhance competition and opportunities for entry into the sector.
- ▶ **Easing regulatory hurdles to allow for the expansion of irrigation to kamzhing and the production of export-oriented crops on chhuzhing:** This report has shown that irrigation is key for productivity growth and climate adaptation, and that its benefits extend beyond paddy. However, extension of irrigation to chhuzhing remains restricted. Expanding irrigation privileges to kamzhing will be a central step in enhancing growth and the sector's resilience. Farmers would also benefit from the ability to redesignate their plots towards internationally competitive crops, such as, cardamom, cabbage, and areca nuts, if their production is feasible. Facilitating the regulations that currently hamper such a transition would be critical.

2.5.3. Targeted support to farmers

Sustainable land management practices are critical to raising productivity and ensuring climate-resilient agriculture, but these have not yet been streamlined into official policies. Sustainable land management practices aim to prevent land degradation and are needed to minimize the risks of climate-induced disasters, including landslides, flooding, and water scarcity. They include activities related to soil and water conservation, natural resource management, terracing, integration of leguminous crops into the rotation, and other practices.¹²⁷ Such practices are especially relevant in Bhutan, which is at high risk of land degradation and associated natural disasters due to its steep-slope topography.

Temporary yield changes induced by climate change may encourage farmers to undertake investments with limited long-term profitability. This chapter has shown that climate change may temporarily increase yields of rainfed maize, one of Bhutan's traditional crops, and these temporary yield changes could distract farmers from taking advantage of

126 Feuerbacher A, et al. "Is Bhutan Destined for 100% Organic? Assessing the Economy-Wide Effects of a Large-Scale Conversion Policy". PLoS One. 2018 June 13;13(6) e0199025. doi: 10.1371/journal.pone.0199025. PMID: 29897989; PMCID: PMC5999226.

127 See, for instance, <https://www.fao.org/land-water/land/sustainable-land-management/en/> and <http://bhutantrustfund.bt/wp-content/uploads/2020/01/CIF-Report1.pdf>

opportunities to invest in exportable vegetables. Government policies should encourage avoiding such lock-ins by providing advice and financial incentives to farmers.

The following considerations can help provide targeted support:

- ▶ **Incorporating indicators and activities related to sustainable land management in planning documents:** An inclusion of such indicators in the upcoming FYPs would ensure their mainstreaming into agricultural policy-making. This could be complemented by district- or local-level sustainable land management plans, developed in consultation with experts and local communities, who lay out applicable practices.
- ▶ **Exploring opportunities for providing targeted advice and extension services through text messages:** Fabregas, Kremer and Schilbach (2019) document the potential of providing digital extension services through mobile phones.¹²⁸ They also highlight the importance of feedback mechanisms to ensure that information is applicable and usable for farmers, and the need for public financing to establish a well-functioning system. Once a system is established, the marginal costs of extension provision through mobile phones are close to zero, making this a potentially scalable undertaking. Such a system could also be used to provide weather information to farmers.
- ▶ **Complementing advice with financial incentives for sustainable land management and critical production inputs:** Sustainable and climate-resilient practices impose an up-front cost (through required investments and changing production) in return for a longer-term gain. Targeted support, for instance, through guarantees to financial sector loans, matching grants, or well-targeted subsidies, can help farmers overcome this timing inconsistency. This would also enable them to invest in production inputs that prevent human-wildlife conflicts, such as fences to ramp up local-level irrigation, and to enable farmers to overcome labor shortages by investing in mechanized production devices and other labor-saving technologies. These incentives need to not only reach intended beneficiaries, but also encourage continued climate adaptation, including by discouraging lock-in investments in crops that are expected to experience reduced yields as climate change progresses (e.g., maize).

128 Fabregas, R., Kremer, M., and Schilbach, F. 2019. Realizing the Potential of Digital Development: The Case of Agricultural Advice". *Science*, 366(6471), eay3038.



3.

Bhutan's Financial Sector: Issues and the Way Forward

3.1. Introduction

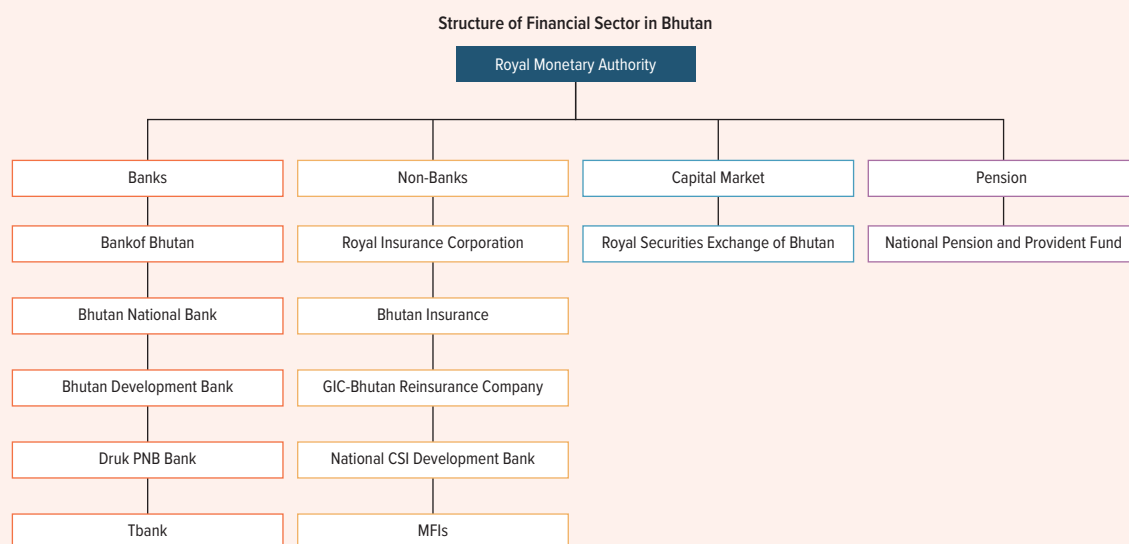
The financial sector in Bhutan has experienced significant growth from the infusion of investments in hydropower projects. This growth has been primarily driven by the public sector and banks, while the capital market has not seen much development (Box 9). In the pre-pandemic years, the expansion of the financial sector resulted in a rapid increase in credit to the non-hydro sectors in the economy.¹²⁹ Despite this, the distribution of credit has been heavily concentrated in only a few sectors. Strengthening the financial sector is critical to efficiently intermediate hydropower rents for financing productive investments in the private sector.

Box 9: Overview of the financial sector

Bhutan's financial sector is dominated by banks, which are pre-dominantly state-owned. The financial sector comprises five commercial banks (including two state-owned banks), the non-banking sector includes three insurance companies, one pension fund, one Credit Information Bureau (CIB), one securities exchange, one loss adjuster, and nine brokers (seven securities and two insurance brokers) (Figure 103). The financial sector is dominated by SOEs, which, at end-2020, accounted for 60 percent of the assets of the banking system and 51 percent of the assets of the non-banks, including the pension fund.

The capital market remains shallow. As of 2021, there were 19 listed companies with a market capitalization of Nu 47 billion (27.4 percent of GDP). The sector is regulated by the Royal Monetary Authority (RMA). Capital markets are regulated by the Royal Stock Exchange of Bhutan (RSEB), which is under the purview of the RMA, with transactions facilitated through a central registration depository¹³⁰.

Figure 101: Overview of the financial sector in Bhutan



Source: Royal Monetary Authority, Annual Supervision Report 2021.¹³¹

¹²⁹ Hydropower resource rents are deposited into Bhutan's financial sector by the Central Government and SOEs and have resulted in high liquidity levels.

¹³⁰ Market intermediaries include seven registered brokerage firms, four brokers, and three private brokerage firms.

¹³¹ RMA. 2021a. "Annual Supervision Report 2021". Royal Monetary Authority, Thimphu, Bhutan.

<https://www.rma.org.bt/RMA%20Publication/Annual%20Supervision%20Report%202021.pdf>



The allocation of credit in Bhutan is skewed, and this has hampered the development of the private sector. Despite rapid expansion of credit to the private sector in the past two decades, the lack of access to finance remains one of the top growth constraints for small- and medium-sized companies. The share of credit extended to cottage and small firms, which account for more than 96 percent of firms in the country, remains very low, while the credit extended to large firms is stagnating. Sectors like tourism and housing account for most of the credit in the economy (see Section 3.2). Further, banks rely heavily on collateral and owner's equity when providing loans. This makes it difficult for micro, small, and medium-sized enterprises (MSMEs) to access finance, as they may not have sufficient collateral or equity. This approach is not in line with international best practices, which emphasize the importance of financial assessments and credit history in lending decisions. There are several other constraints that hamper the flow as well as the allocation of credit, including: (i) weakening financial sector performance and rising non-performing loans (NPLs); (ii) an underdeveloped non-bank sector, limiting alternative sources of finance for businesses; and (iii) inadequate financial inclusion.

The financial system has been significantly weakened by the COVID-19 pandemic. Loan recovery and asset quality are likely to remain weak due to the slow recovery of the tourism industry and because of outward migration. Subdued tourist arrivals and emigration can have negative repercussions on financial sector soundness since 61.3 percent of loans were concentrated in the services, tourism, and housing sectors as of December 2022. Emigration can have a dampening effect on prices of rental property and newly developed real estate as migrating people may sell their properties before migrating. The loan repayment capacity of migrants is not expected to strengthen in the short term, as people are migrating mostly on student visas. Given that over 60 percent of the assets in the financial sector are owned by the State, this poses fiscal risks through increased contingent liabilities.

Bhutan is highly susceptible to the adverse effects of climate change, and it is crucial to take further action to mitigate the financial risks associated with climate events. Key risks and natural hazards include flash floods, riverine floods, landslides, dam outburst floods, cloudbursts, glacial lake outbursts, forest fires, and windstorms. These climate events not only pose a threat to natural resources, economic sectors, and communities, but also have the potential to result in financial risks. While Bhutan has taken important steps at the national level to adapt to the impact of climate change and pursue a low-emission development path, more can be done to enhance resilience and ensure a sustainable, low-carbon future.

This Chapter is organized as follows: Section 3.2 highlights the concentrated nature of Bhutan's financial sector and discusses credit constraints in the non-hydro sectors. Section 3.3 discusses the challenges, including those emanating from the COVID-19 pandemic, financial inclusion, and potential impacts from climate change. Section 3.4 provides policy recommendations.

3.2. Concentration and credit allocation in the financial sector

The banking sector is highly concentrated, with the BoB receiving the majority of deposits and benefiting from a lower cost of funds. The banking sector accounts for 75 percent of the financial sector's assets and nearly 80 percent of its credit. The BoB, which is mostly government-owned (with a 20 percent stake held by the State Bank of India), dominates the sector (Figure 102, Figure 103).¹³² It holds 44 and 48 percent of the banking sector's assets and deposits, respectively, making it the largest commercial bank in the country.¹³³ The BoB has a widespread presence, with branch offices, extension offices, and agents in every Dzongkhag and major township. While competition has increased with the establishment of three additional banks during the 2008-2010 period – Bhutan Development Bank (BDB), Druk PNB Bank, and T Bank – the BoB maintains a lower cost of funds compared to the other banks. This is due to large SOEs and projects maintaining their main accounts with this bank.¹³⁴

¹³² The BoB was the only commercial bank until 1997 when the BNB was launched as the country's second commercial bank. The BoB served as the country's central bank until the RMA was established in 1983.

¹³³ In 2021, BoB's deposit market share was 47.6 percent followed by BNB at 23.8 percent and BDB at 14.4 percent.

¹³⁴ The BoB's demand deposit comprises 31.4 percent of its total deposit portfolio and continues to include deposits from the Government as well as major SOEs and projects.

The market share of non-banks has been growing over the last decade, although it still represents less than a quarter of the total financial sector assets (Figure 104). The non-banking sector comprises three insurance companies, namely the Royal Insurance Corporation of Bhutan (RICB), Bhutan Insurance Limited (BIL), and the Bhutan GIC Reinsurance Company, as well as the National Pension and Provident Fund (NPPF)¹³⁵ and five microfinance institutions (MFIs).¹³⁶ The share of non-banks in total financial sector assets has increased from below 10 percent in 2012 to 23 percent in 2022, while their share in credit doubled from 11 to 22 percent during the same period (Figure 105). Non-banks, such as insurance firms, were permitted to compete with banks in lending to individuals and firms due to limited investment opportunities, particularly in corporate bonds. However, non-banks are more susceptible to maturity mismatches and weak supervision compared to banks. They also possess a lower capacity to absorb losses.

Figure 102: Banking sector asset size (Nu. Billion), 2015 and 2021

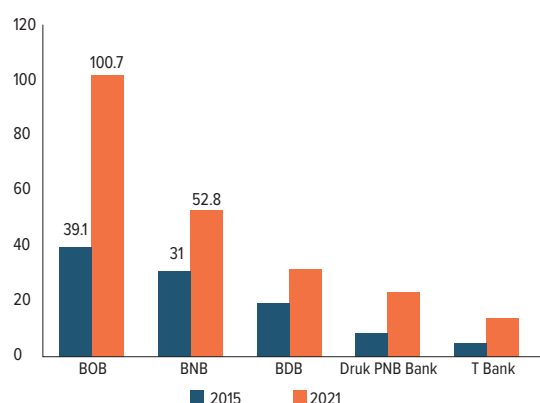


Figure 103: Banking sector deposits (Nu. Billion), 2015 and 2021

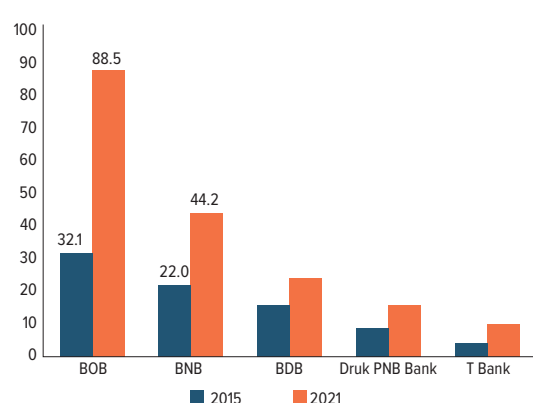
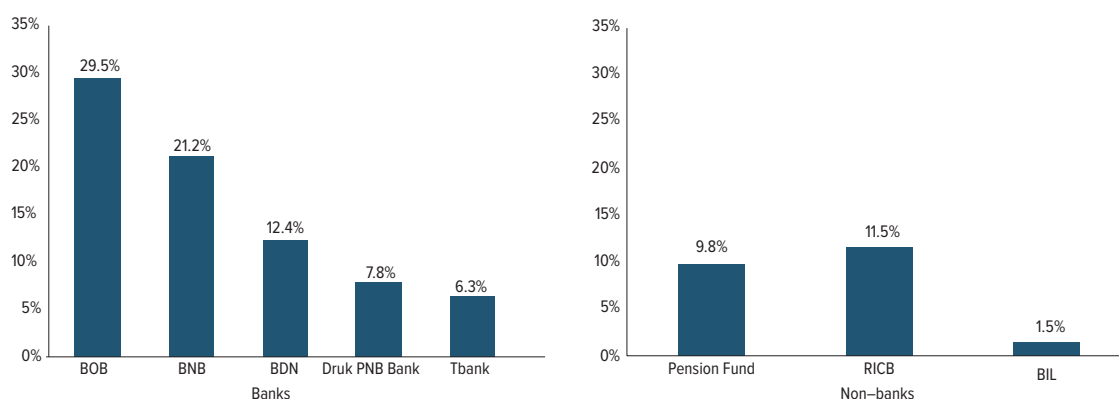


Figure 104: Share of banks and non-banks in financial sector assets, 2022



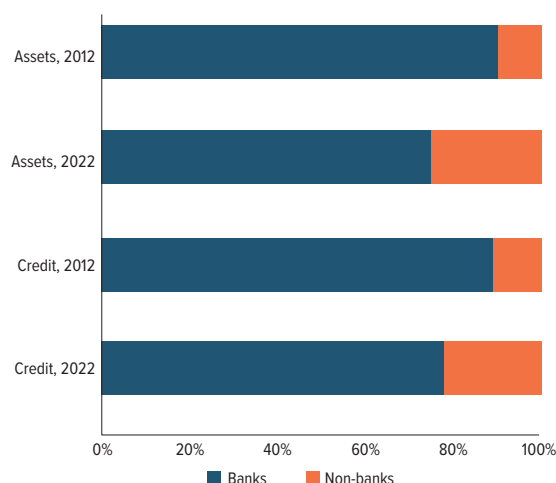
Source: Royal Monetary Authority Financial Sector Performance Review Reports.

State-Owned Financial Institutions (SOFIs) dominate the financial sector. Three out of five banks are state-owned. In 2020, SOFIs accounted for 60 percent of the assets of the banking system and 51 percent of the assets of the Non-Banking Financial Institutions (NBFIs), including the NPPF. Bhutan has the second highest level of state-ownership in the banking sector in the South Asia Region (SAR), exceeding by a large margin the average levels seen in other countries (Figure 106).

¹³⁵ In 2000, the NPPF was established as an autonomous agency to manage pension and provident fund schemes of civil servants, employees of state-owned corporations and the armed forces. The plan is managed on a partially funded pay-go system and therefore maintaining sustainability is a major issue. Private pensions are managed by insurance companies through a fully funded private provident fund scheme. However, to expand coverage, the NPPF has also started to manage private provident fund schemes.

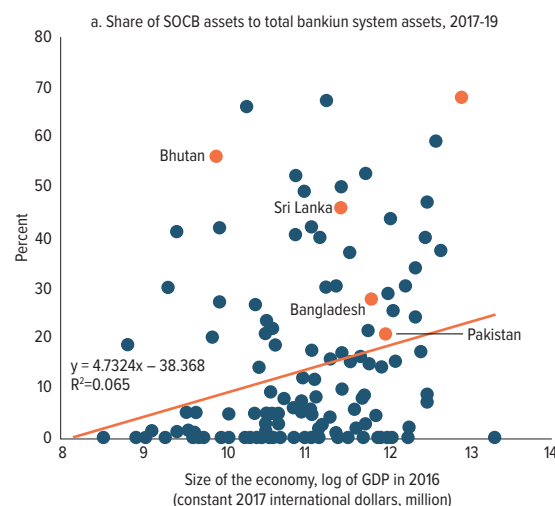
¹³⁶ These include RENEW, Bhutan Care Credit (BCC), BAOWE, Microfinance Bhutan, and Tarayana Foundation. The MFIs currently operate in all 20 Dzongkhags.

Figure 105: Share of banks and non-banks in assets and credit, 2012 and 2022



Source: Royal Monetary Authority Financial Sector Performance Review Reports.

Figure 106: Share of state-owned commercial banks assets to total banking system assets, 2017-2019



Source: World Bank (2021). Hidden Debt: Solutions to Avert the Next Financial Crisis in South Asia.

Credit flow is concentrated in a few sectors, reflecting the lack of diversification in the private sector, and is declining for production and manufacturing activities. A comparison between the Economic Census of 2018 and the Enterprise Survey of 2022 indicates that wholesale and retail trade, as well as accommodation and food services, continue to dominate the share of firms albeit a modest decline in their share of total credit from nearly 83 percent in 2018 to around 80 percent in 2022 (Figure 107). On the other hand, the share of firms in construction, administrative support service activity, and manufacturing sectors has increased slightly. In terms of credit outstanding, the housing sector, along with services and tourism, accounted for around 50 percent of total credit in 2022. However, the share of trade and commerce, as well as production and manufacturing in total credit declined by more than 5 percentage points of GDP between 2014 and 2022. Banks have the highest exposure to the housing sector, while non-banks have the highest exposure to services and tourism.

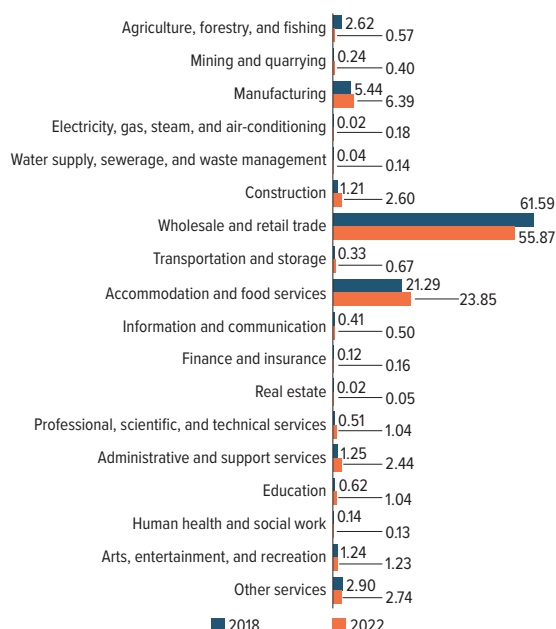
The share of cottage firms increased between 2018 and 2022, although their share in credit remained below 10 percent. The share of cottage firms increased from 89 to 96 percent, while the share of medium, large and small firms declined (Figure 108). This shift could indicate the entry of new firms or the exit of older and larger firms in response to the pandemic. Despite the overwhelming share of cottage firms, only 8 percent of the total credit is directed towards them (Figure 109). Around 60 percent of credit is directed to non-enterprises, which reflects the increasing prevalence of housing and educational loans in recent years and further highlights the lack of diversification in the economy. Notably, the allocation of credit to small- and medium-enterprises has declined significantly in recent years. The share of large firms, however, has remained mostly unchanged at around 14 percent.¹³⁷

The capital markets are shallow. Although there has been an increase in the market capitalization-to-GDP ratio from 15.6 percent in 2016 to 27.4 percent in 2021, it remains relatively low compared to peers. Market capitalization experienced a decline from 2019 due to the fluctuation in share prices and the delisting of two companies in 2020. Market liquidity, measured by the turnover-to-GDP ratio, increased to 1.8 percent in 2020 but declined to 1.5 percent in 2021, and it remains the lowest in the SAR. One of the contributing factors to this low liquidity and trading activity is the lack of diversification in the economy, which limits the number of listed companies. Listings on the main exchange have stagnated in recent years. Further, the pace of growth has been constrained by minimal Initial Public Offering (IPO) activity

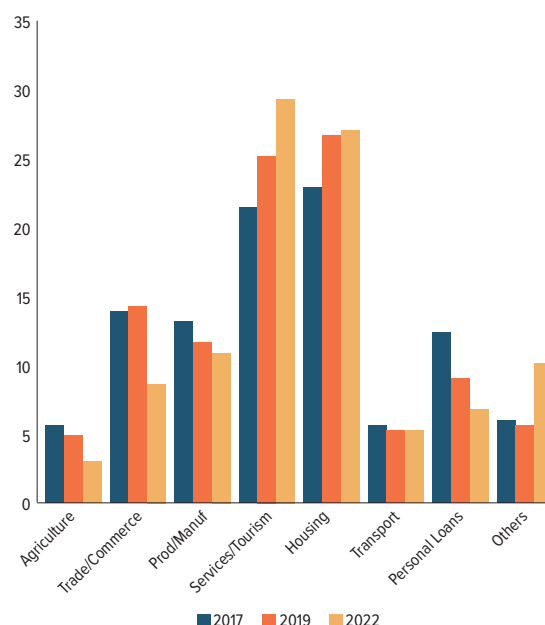
137 As per the Annual Report 2021 of the Department of Cottage and Small Industries, CSIs constitute the overwhelming majority of industry in Bhutan, accounting for about 95 of the total industries. Despite the pandemic, the number of active licensed CSIs increased to 26,945 in 2021, from 21,813 in 2020.

Figure 107: Distribution of firms and credit as per economic sectors

a. Distribution of firms, 2018 and 2022



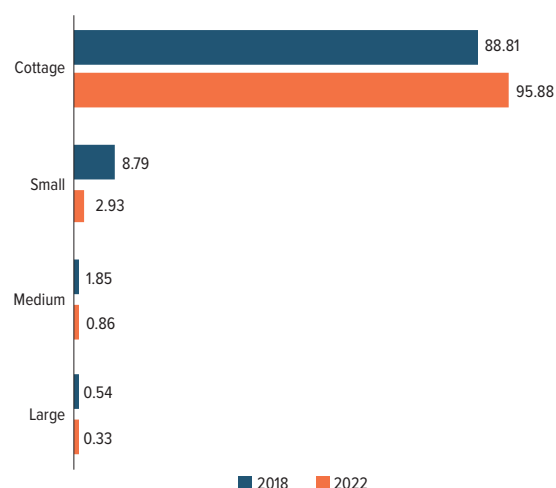
b. Distribution of credit, 2017, 2019, and 2022



Source: World Bank staff calculations based on the 2022 Enterprise Survey and the 2018 Economic Census.

Note: "Others" include education loans.

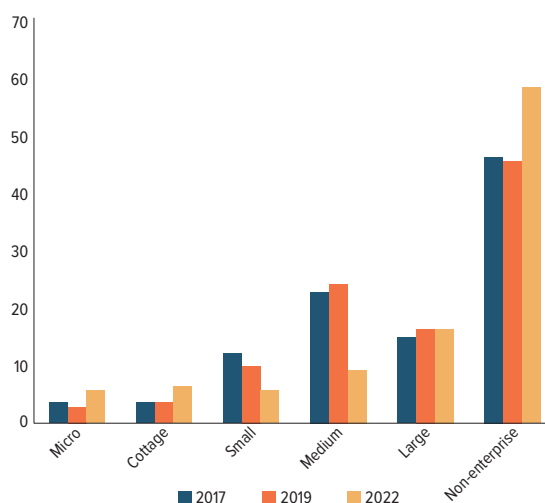
Figure 108: Distribution of firms by size (percent), 2018 and 2022



Source: Royal Monetary Authority.

Note: Non-enterprises include housing, transport, personal, staff, and education loans. Cottage firms have less than five employees, small firms have between five and 19 employees, medium firms have between 20 and 99 employees, and large firms have 100 employees or more.

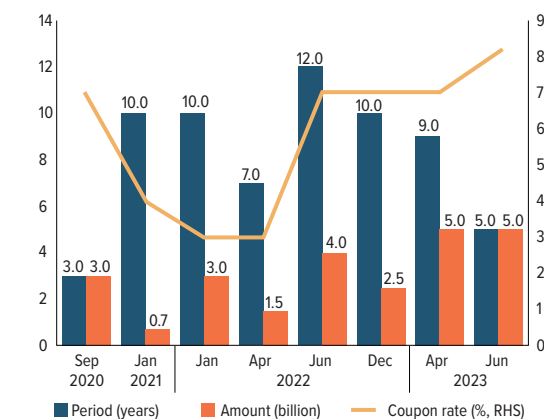
Figure 109: Credit composition by firm size (percent of total), 2017, 2019, and 2022



and the consequent stagnation in listings on the stock exchange. There are several possible reasons for this low growth, including factors related to issuers and investors (see section 3.3), as well as the absence of underwriting regulation and capability in the market. The lack of deep capital markets has also led to insurance and pension funds lacking feasible investment options, resulting in some of them engaging in credit business and competing with banks.

In terms of the bond market, its financial significance remains marginal. Domestic public sector debt has increased from 1 percent of GDP in 2012 to 13 percent of GDP in 2022, mostly reflecting the authorities' development of the domestic debt market in response to the COVID-19 pandemic, which led to a decline in tax revenues and increased spending pressures. Domestic debt is mostly in the form of treasury bills and 3- to 12-year treasury bonds. The Government issued eight longer term bonds between September 2020 and June 2023, with banks and the public pension fund being the main subscribers (Figure 110, Table 6).¹³⁸ There have been no bond issuances in recent years by corporates or banks.¹³⁹

Figure 110: Government Bond issuance, Sep 2020-Jun 2023



Source: Royal Monetary Authority, Royal Stock Exchange of Bhutan (RSEB)

Table 6: Share of ownership (equities and bonds), 2021

Ownership (%)	Stocks 2021	Bond market 2021
Banks	7	45
Insurance firms	5	3
Pension fund	11	28
Retail investors and HNIs	48	0.5
Others	27	23.5

Source: Royal Stock Exchange of Bhutan. 'Others' include corporate portfolios, trust funds, religious institutions and associations.

3.3. Financial sector challenges and recent measures

Banks in Bhutan primarily offer traditional lending products and have not adopted risk-based pricing. Despite some expansion in the range of financial instruments offered by banks, financial instruments are still dominated by traditional banking products. Banks mostly offer basic credit products with fixed interest and terms.¹⁴⁰ This is partly because banks still assess loan requests against collateral, and not based on the borrower's financial viability. Financial Institutions (Fis) in Bhutan do not use risk-based pricing that links the credit score of the borrower to the interest rate of the loan. The reliance on collateral by banks has led borrowers to seek alternative sources of financing from non-bank lenders.

The surge in credit witnessed during the middle of the past decade was not sustained. The private credit to GDP ratio increased from 46 percent in 2015 to 74 percent in 2021,¹⁴¹ primarily driven by hydropower-related flows. However, the adverse impact of the pandemic on tourism and hospitality, as well as the construction and manufacturing sectors, impacted credit growth. Due to weaker demand from the private sector, credit growth moderated to an average of 7 percent in 2021 and 2022, in nominal terms, compared to an average of 18 percent between 2014 and 2019.

¹³⁸ It started with the issuance of a three-year bond at the prefixed rate of 6.5 percent and then two 10-year bonds through open auction.

¹³⁹ However, since 2017, there have been a total of 21 issuances of Commercial Papers with a maturity of 180 days by various SOFIs. The issuance size has mostly been small.

¹⁴⁰ Since 2016, they have also started to offer some credit products with floating interest rate.

¹⁴¹ Bhutan's private credit to GDP ratio is much higher than that for other South Asian countries such as India, Sri Lanka and Maldives (Figure 5). Only Nepal has a higher private credit to GDP ratio of around 97.7 percent in the region.

Loan asset quality has steadily deteriorated. Between 2014 and 2019, the deterioration in loan asset quality can be attributed to overexuberant lending practices, without sufficient credit appraisal, monitoring and recovery management. Non-banks, in particular RICB and BIL, reported higher NPLs compared to banks (Figure 113, Figure 114).¹⁴² High NPLs in the non-banking sector resulted from the fact that the insurance companies were engaged in intermediation due to lack of investment opportunities in the capital markets. Within the banking sector, the BDB reported the highest NPLs—largely due to the nature of its activities—followed by the Bhutan National Bank (BNB). By June 2020, with the onset of the pandemic and a sharp slowdown in economic growth, the NPL ratio increased to nearly 15 percent as most firms faced significant challenges in meeting their debt repayments. The majority of NPLs are concentrated in the services and tourism sector (33 percent), followed by trade, production and manufacturing, and the housing sectors (Figure 115). The RMA has suspended fresh lending to the housing sector until December 2023 due to high credit concentration and non-performing loans in the sector.

Figure 111: Gross NPL and credit growth (percent), 2012-2023

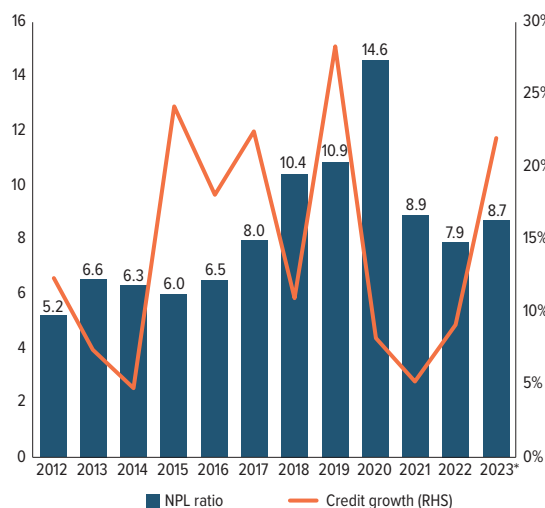


Figure 112: Sectoral composition of NPLs, 2017, 2019, and 2022

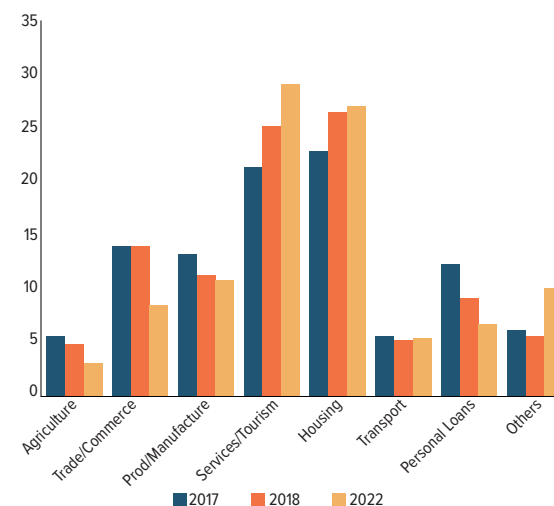
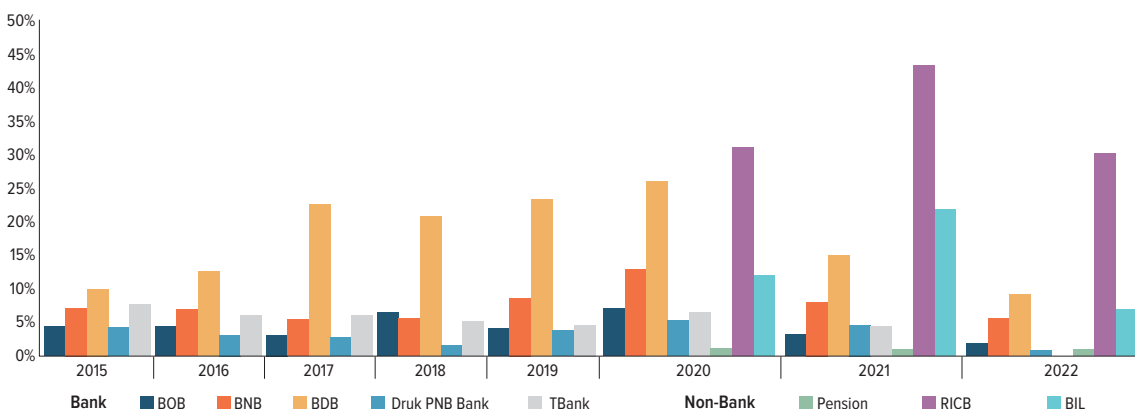


Figure 113: Gross NPL, banks and non-banks (percent), 2015-2022



Source: Royal Monetary Authority, World Bank annual reports. Note: *data for 2023 is for the month of March, while data for other years is for the month of December. In Figure 115, the 2022 data for Bhutan National Bank and Bhutan Development Bank is for September while the rest pertains to December.

142 The NPL for the non-bank sector was rising even before the COVID-19 impact, mainly due to low government expenditure in the construction and contract sector and greening of loans.



The NPL ratio is expected to rise once forbearance measures are withdrawn. The decline in the NPL ratio in 2021 and 2022 largely reflects the lack of recognition of potentially stressed assets. Financial sector risks are underreported in official statistics due to regulatory forbearances. Borrower relief measures included measures such as full or partial interest waiver and loan repayments deferments, funded through the National Resilience Fund (NRF). As a result, the decline in the NPL ratio in 2021 and 2022 reflects adjustments in NPL accounting, changes in risk-weights for NPLs, and the writeback of provisions from NPLs as part of the NPL management strategy and resolution framework.¹⁴³ The NPL ratio may increase further with better recognition of asset quality over the coming years. Persistent NPLs may hinder the extension of fresh credit, particularly to riskier segments such as MSMEs. In 2022, the RMA adopted a Prompt Corrective Action (PCA) Framework to enable early supervisory intervention and mitigate any risk that could threaten the viability of financial service providers and the overall system. Two out of five commercial banks and one insurance company were under PCA as of May 2022.

The rise in NPLs, prior to forbearance, mirrors a decline in profitability within the banking system. The net interest margin — the difference between the interest earned and the interest paid — has declined for most banks in recent years (Figure 114).¹⁴⁴ The decline is a result of slower credit growth and an increase in deposits, which has compressed interest margins. The overall return to assets (RoA) of the financial sector declined from 2.6 percent in 2015 to 0.9 percent in 2020, before improving in 2022 due to the monetary measures implemented by the RMA. The moderate growth in outstanding loans was mostly due to an increase in interest outstanding, owing to loan deferment measures by the RMA. Currently, the declining RoA of banks reflects the lack of profitable opportunities available in the market (Figure 115).

The financial sector remains capitalized above the regulatory threshold of 12.5 percent; however, the Capital Adequacy Ratio (CAR) shows a declining trend.¹⁴⁵ The CAR has been declining for most banks over the past few years (Figure 116). For the non-bank sector, capital adequacy improved from 9.4 percent in 2019 to 19 percent by December 2021, supported by the infusion of fresh capital by some of the financial institutions (Fis) and monetary measures introduced by the RMA. Overall capital adequacy declined from 18.3 percent in 2012 to 15 percent in December 2021 because of increasing NPLs and lower profits. In particular, BDB and one of the insurance companies faced difficulties in meeting the capital requirements due to high NPL levels. The risk weighted CAR of banks increased marginally from 15.1 percent in March 2022 to 15.7 percent in March 2023.

Bhutan is highly vulnerable to the physical and financial risks emanating from climate events. The country is susceptible to physical risks resulting from the gradual and sudden impacts of climate change on its real assets, which in turn have financial implications. To some extent, it is also exposed to climate transition risks that arise from the ongoing efforts to decarbonize the economy. These transition risks can impose economic adjustment costs on firms and investors who did not anticipate the transition.

Investment at scale will be required for Bhutan to meet its climate-related and environmental goals because funding from public sources alone will not meet the financing gap. The financial sector could play an important role in bringing private finance to meet climate goals — by deepening green finance markets and improving the management and pricing of climate-related financial risks. Despite taking important steps, financial sector authorities, such as the RMA and MoF, are still at the initial stages of developing the infrastructure and policy environment to help financial institutions manage climate risks and better leverage opportunities (Box 10).

Access to finance is a concern for both individuals and businesses. As of December 2021, 79.5 percent of the adult population held savings accounts; the percentage was higher for men (52.6 percent) than for women (47.4 percent). However, only 22.9 percent of the adult population had access to credit, of which 56.7 percent were men and 43.3 percent were women. Only 19.4 percent of adults had life insurance coverage, with most being men (55 percent). Despite a high mobile phone penetration rate of 95 percent, only 21.6 percent of adults had access to eMoney. Many rural communities still lack access to formal remittance services, preventing them from benefiting from modern electronic

¹⁴³ The framework focuses on (i) preventing a loan from becoming an NPL (flow) by implementing effective and efficient processes and systems, and (ii) resolving the current NPLs (stock).

¹⁴⁴ The RMA's loan moratorium led to borrowers not making payments and interest accruing on outstanding balances. Since the accrued interest is added to the outstanding loan amount, the outstanding credit increased.

¹⁴⁵ Capital adequacy is aligned with Basel III regulations, while the liquidity coverage ratio is only monitored and not enforced. The minimum CAR threshold was lowered from 12.5 percent to 10 percent during COVID-19, by removing the 2.5 percent capital buffer as a regulatory forbearance measure to address the impact.

Figure 114: Net interest margin (percent), 2015-2021



Figure 115: Return on assets of banks (percent), 2015-2022

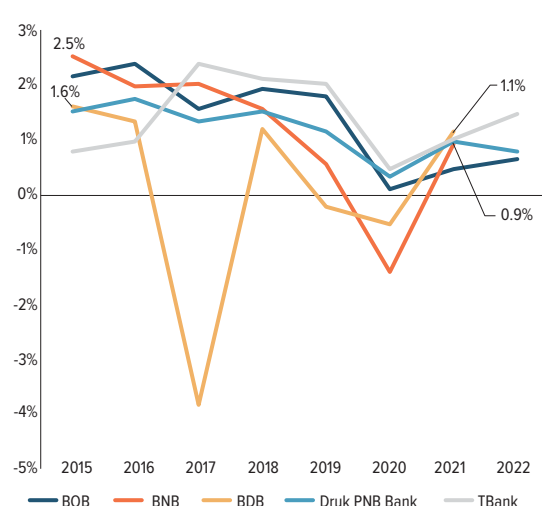
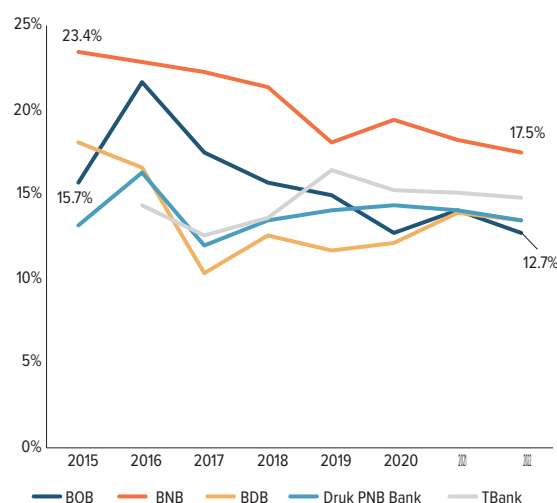


Figure 116: Capital adequacy ratio of banks (percent), 2015-2022



Source: Royal Monetary Authority. Note: In Figure 116, data for the year 2022 is not available for Bhutan National Bank (BNB) and Bhutan Development Bank (BDB). In Figure 117, 2022 data for BNB and BDB is as of 30 September, all other data is as of 31 December.

and online payment systems. The penetration of bank branches and ATMs remains very low, with Bhutan having the lowest numbers compared to other countries in SAR (Figure 119). Access to finance remains a major concern for private businesses and rural entrepreneurs. Uneven access to bank credit, complex loan procedures, and a limited range of financial instruments offered by banks, continue to impede access to finance. In rural areas, there is a significant unmet demand for simpler banking services.

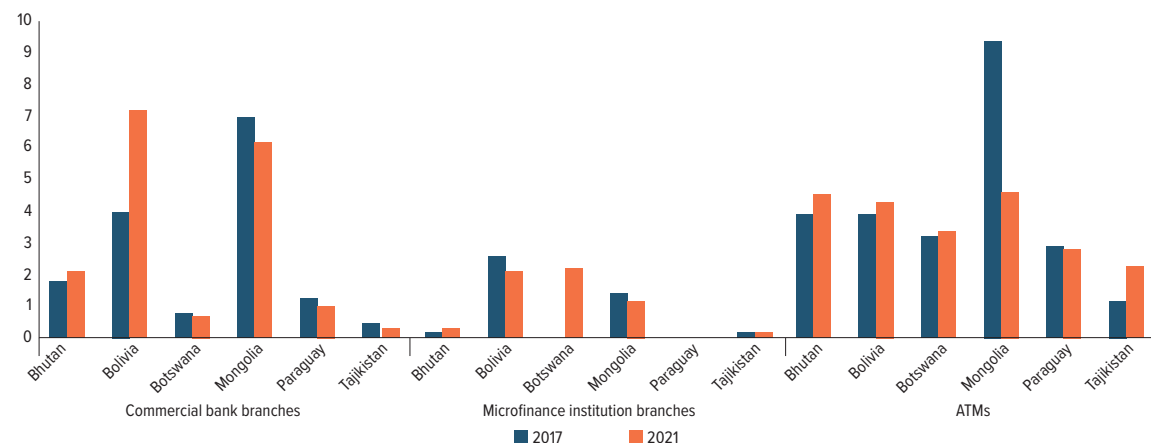
Access to finance is further constrained by the absence of appropriate risk sharing and credit enhancement instruments, as well as banks' risk aversion to lend to MSMEs. A sustainably designed risk sharing facility, such as a partial credit guarantee scheme, can incentivize banks to lend to these sectors without generating contingent liabilities. Such schemes should be introduced on a long-term basis, with the goal of promoting MSMEs in order to diversify the non-hydro sectors, rather than only as short-term measures like the existing NCGS. The design of the scheme can follow international best practices and could be complemented by capacity-building support for the borrowers.

Box 10: Recent steps to encourage green finance

The Green Finance Roadmap for Bhutan is an important step taken by the RMA to align financial sector policies, regulations, and incentives with the country's environmental and climate goals. This roadmap outlines the strategic direction to promote sustainability within the financial system and identifies necessary developments to advance Bhutan's green finance agenda. The roadmap will help prioritize actions and coordinate efforts among various stakeholders, including financial and environmental policymakers, supervisors, regulators, and sector participants. Bhutan's Green Finance Roadmap covers key elements for effectively greening the financial system. It includes high-level policy actions with implementation timeframes. It also addresses governance and coordination, risk management, and a discussion of green finance flows. Further, it recognizes the potential for more reforms, beyond the banking sector, encompassing non-banks, insurance companies, capital markets, and institutional investors.

Bhutan has developed a national green taxonomy to support informed decision-making by financial actors regarding environment-friendly investments. This taxonomy aims to scale up finance for climate mitigation, adaptation, and other environmental goals; facilitate reliable and comparable disclosures related to sustainability risks and opportunities; and provide a starting point for standard setters and product developers. It complements actions taken by authorities to align environmental regulations with fiscal policies that support the greening of the economy. A taxonomy can further promote market integrity by reducing 'greenwashing'. The Bhutanese green taxonomy demonstrates good practices by clearly formulating its purpose, environmental objectives, conceptual framework, and target users, and by incorporating key principles such as the do-no-harm clause. Additionally, it considers taxonomies from other countries and initiatives to lay the foundation for future harmonization efforts.

Figure 117: Access to finance (per 10,000 adults), 2017 and 2021



Source: Financial Access Survey.

Access to foreign private capital for domestic firms is limited in Bhutan, reflecting significant restrictions on capital account movements.¹⁴⁶ Bhutan has one of the most restricted capital accounts in the world, with long-standing capital controls to all categories of transactions (see AREAER 2020).¹⁴⁷ While the FDI framework has been gradually liberalized, the number of approved FDI projects and their aggregate size has been declining.¹⁴⁸ Further, there are only five instances where Bhutanese companies have been permitted to borrow from external sources in the recent decade. The

¹⁴⁶ World Bank. 2022. "Assessment of the External Commercial Borrowing (ECB) Regime in Bhutan". World Bank, Washington DC.

¹⁴⁷ See AREAER Country Reports for Bhutan on <https://www.elibrary-areaer.imf.org/Pages/Reports.aspx>

¹⁴⁸ The FDI framework still includes relatively high minimum thresholds, local participation rules, and sectoral restrictions.

Government has recently eased access to External Commercial Borrowing (ECB) for the real sector (i.e., non-equity capital flows) to improve access to international finance for domestic firms but continues to limit ECB for the financial sector.¹⁴⁹ ECB is relatively closely regulated in South and Southeast Asia but is less prevalent elsewhere.¹⁵⁰ Other countries usually restrict the outflow of capital but not the inflow.

The payment system is still predominantly cash-based, with limited use of digital technologies. However, the COVID-19 pandemic emphasized the importance of digital services during lockdown periods. During this time, the Government, FIs, schools, and institutions increasingly relied on digital finance and payment systems (Government to Citizens [G2C]) to meet their needs. In line with the RMA 10-year Roadmap (2021-2030), Bhutan aims to leverage the National Digital Identity as a key foundation for transforming the financial sector through FinTech services, and peer to peer (P2P) and business to business (B2B) lending models. To support and encourage the growth of the FinTech ecosystem, the RMA adopted the FinTech Regulatory Sandbox. Additionally, the RMA developed the Data Warehouse and Analytics System to modernize the financial sector and enhance policy decision-making using emerging digital technologies. The Government, RMA and FIs should ensure that FinTech is utilized to bridge the gaps in financial inclusion in Bhutan. This can be achieved through faster and more affordable payments, collateral-free digital lending, and the introduction of innovative capital market and insurance products for retail customers.

Various steps have been undertaken recently to bolster access to finance. The regulatory approach of the RMA has often prioritized credit affordability, but the banks may not always have the incentives or opportunities to appropriately price risks. To improve access to finance, the RMA launched the Priority Sector Lending Guidelines in 2017, along with amendments to the Credit Information Bureau Rules and Regulations, to enable better assessment of borrowers' creditworthiness beyond collateral considerations. In 2020, the Government launched the National CSI Development Bank and the NCGS to improve access to credit (Box 11).¹⁵¹ However, despite the establishment of the CIB, bank lending still relies primarily on collateral. Recognizing challenges such as the lack of formal credit history, collateral, and low financial literacy, the RMA launched the Financial Inclusion National Action Plan (FINAP, 2019-2023) to improve access and financial inclusion.¹⁵² The FINAP focuses on leveraging innovative technologies to expand the benefits of modern electronic and online payment systems in rural areas.¹⁵³ In 2021, two mobile operators started *eTeeru* and *B-Ngul* wallets, enabling individuals to make payments through mobile phones without needing bank accounts.

The RMA has implemented various reforms to make the financial sector more responsive to emerging priorities and maintaining financial stability. These reforms include regulatory interventions aimed at improving credit intermediation, facilitating fund flow to CSIs, strengthening corporate governance and risk management systems, and promoting the digital economy. Regulations have been updated to comply with International Financial Reporting Standard-9 (IFRS 9) and Basel III, ensuring prudential regulations are in line with international standards. The payments and clearing systems have been modernized, with the introduction of Real-Time Gross Settlements (RTGS) and the use of the SWIFT system. The RMA is proposing amendments to the Financial Services Act 2011, to allow insurance companies to offer composite insurance (both life as well as non-life). A feasibility study for Central Bank Digital Currency (CBDC) has been completed to align with the RMA's efforts to embrace a digital economy. The RMA has prepared a Ten-Year (2021-2030) Strategic Plan (Druk Nguldrel-Lamtoen 2030) to respond to the changing demands of an economy that is increasingly driven by technology and innovation.¹⁵⁴

149 The 2023 ECB Guidelines shortened the minimum required loan maturity, broadened the allowable end-use (utilization) of ECB proceeds, including working capital to liberalize refinancing options and increase the maximum allowed interest rates. The guidelines also introduced an automatic approval process for loans that meet eligibility criteria (amount, end-use of the funds, minimum maturity period).

150 The current ECB framework in Bhutan is largely built on criteria used in other countries in the region, including India, Nepal, Bangladesh.

151 The National CSI Development Bank was merged with the BDB in 2023 as a result of financial losses and overlapping mandates.

152 See RMA. 2019. "Financial Inclusion National Action Plan (FINAP), 2019-2023". RMA, Thimphu, Bhutan. <https://www.rma.org.bt/RMA%20Publication/papers/FINAP%20Four%20Pillars%20Brochure.pdf>

153 The FINAP targets 85 percent financial inclusion by 2023 from the baseline of 64 percent in 2017.

154 RMA. 2021b. "Druk Nguldrel-Lamtoen 2030" RMA, Thimphu, Bhutan.

https://www.rma.org.bt/assets/images/news_image/druk%20nguldrel%20lamtoen.pdf



Box 11: Recent steps to improve access to finance

Priority Sector Lending. Bhutan launched a Priority Sector Lending (PSL) program and guidelines to improve access to finance. Under this program, agricultural Cottage and Small Industry (CSI) loans for primary production are insured to address collateral requirements, while loans for other activities are based on cash-flow or project financing practices instead of collateral. Priority Sector Lending (PSL) clients can receive loans up to Nu. 500,000 for primary production in agricultural CSI. The preferential interest rates are 8 percent per annum for non-agricultural CSI and 8.5 percent per annum for value addition in agricultural CSI. The majority of outstanding PSL loans (61 percent) are in the non-agricultural CSI sector, followed by agricultural CSI sectors (39 percent). However, more loans were sanctioned to the agricultural CSI sector in terms of the number of accounts. Approximately 80 percent of the loans were disbursed through the BNB and the BoB.

National CSI Development Bank. The National CSI Development Bank was established by the Government in February 2020 as a government-owned non-deposit bank SOE. Since its inception, the NCSI has been providing microloans to the agriculture sector at 2 percent, and to the non-agriculture sector at 4 percent, in order to mitigate the impact of the pandemic. Because of high NPLs and failure to recover loans, the authorities have decided to merge the national CSI bank with BDB.

National Credit Guarantee Scheme. The NCGS was launched in October 2020 in response to the COVID-19 pandemic to improve access to credit. Participating banks, including BOB, BNB, and the National CSI Development Bank, receive government guarantees to enable lending without the need for collateral. The scheme has been successful in improving access to credit and promoting financial inclusion. Currently, there are 213 projects under the scheme, with a total loan amount of Nu. 852.08 million.¹⁵⁵

3.4. Policy priorities

Despite the rapid development in Bhutan's financial sector, it faces numerous systemic risks and challenges. Moving forward, reforms are necessary to mitigate systemic risks, promote financial deepening, improve governance, strengthen regulations and oversight mechanisms, and bolster inclusion. These measures are crucial to complementing the diversification of the economy and fostering private sector growth. The following policy recommendations could be considered for addressing the existing gaps and vulnerabilities.

3.4.1. Financial stability and governance of FIs

Despite efforts made by the RMA in recent years, significant improvements in supervision and regulation are still required. The regulatory regime can be further enhanced by moving from the existing compliance and performance-based supervisory models towards a risk-based supervisory approach. The insurance sector, in particular, faces challenges due to limited regulatory and supervisory capacity. Therefore, it is crucial for the RMA to strengthen its capacity to effectively supervise the insurance sector and promote the development of a resilient and credible insurance industry. Further, implementing risk-based solvency requirements for the insurance sector and amending the Financial Services Act 2011, to allow composite insurance by insurance companies for example, should be prioritized. Given the high attrition rate in the RMA and public services, it is also important to develop a new pool of supervisors with the necessary skills.

¹⁵⁵ The guarantee is limited to the debt financing of the project. It covers loans not exceeding Nu. 30 million by way of term loans. Debt to Equity Ratio under scheme is 90:10, which is significantly lower than the existing levels of the financial institutions.

Detailed guidelines for credit underwriting are essential to reduce risks during loan origination. According to the NPL Management Strategy, the top 20 NPLs were primarily caused by two factors: common clients with high loan exposures and inadequate securities being pledged.¹⁵⁶ This highlights the need for comprehensive guidelines, which fls must adhere to during the credit underwriting process. While the Risk Management Guidelines 2019 provide an overview of procedures for credit appraisal, the increase in NPLs suggests uneven compliance. Although lenders have comprehensive credit manuals in place, it is crucial to assess the level of their application. Therefore, addressing credit underwriting needs to be prioritized.

Strengthening credit monitoring is crucial for fls to address the risk of borrowers failing to meet their contractual commitments. This can be achieved by developing appropriate internal procedures and reporting mechanisms to identify and manage potential non-performing customers at an early stage and prevent deterioration in credit quality. Effective credit risk monitoring involves using Early Warning Indicators (EWIs) and Key Risk Indicators (KRIs) during loan origination and throughout the life cycle of the loan. Sensitivity analysis and stress testing should also be conducted. The RMA could issue a guideline that outlines the fundamental principles for establishing an early warning system. Financial institutions could assess any gaps in their systems using this guideline, and the RMA could request a timeline for implementing necessary improvements. Regular reviews and assessments can be conducted during onsite inspections. Further, institutions need to align their credit risk strategy, including credit-granting decisions, with capital and liquidity planning, the Internal Capital Adequacy Assessment Process (ICAAP), the Internal Liquidity Adequacy Assessment Process (ILAAP), and the broader risk appetite framework.

The current loan pricing mechanism could be modified to reflect borrower risks. It is important to have a system of risk-based pricing that considers factors such as risk appetite, business strategies, profitability, and risk perspective. Financial institutions should develop approaches to pricing that are tailored to the type and credit quality of borrowers, offering different loan prices based on the specific type and credit quality of borrowers. For MSMEs, the pricing could be more focused on the overall portfolio and specific product offered, whereas for medium and large enterprises, the pricing could be more customized to the individual borrower's circumstances.

The bankruptcy and insolvency framework could be further developed to facilitate the prompt resolution of NPLs. The Bankruptcy Act of 1999 currently offers protection for insolvent companies seeking bankruptcy. Further, the enforcement of this law falls under the jurisdiction of the judiciary. Currently, most cases of loan defaults are litigated in court by borrowers and financial services providers, which can be both expensive and time-consuming. The Bankruptcy Act should be reviewed and amended to establish a framework that enables businesses to effectively resolve insolvency and strengthen creditor rights. Up until now, no one has sought protection under the Bankruptcy Act. Instead, the fls are opting for out-of-court settlements to expedite insolvency cases, using provisions outlined in the NPL resolution framework. Given that this practice is relatively new in Bhutan, it will be essential to further enhance institutions such as arbitration and build capacity for the settlement of insolvency and bankruptcy cases. The court processes to seize collateral in a timely manner have improved in recent years, particularly with the establishment of commercial benches in Thimphu. However, additional benches are needed in major Dzongkhags.

Ensuring a level playing field for SOFIs and other banks can address risks to financial stability. Public-owned banks hold the majority of deposits in the economy. For example, the BoB's advantage in cost of funds, compared to other banks, can be attributed to its large deposit base in the public sector. Consequently, BoB's market share has increased significantly over the years. To promote a more diverse banking system and reduce reliance on a single dominant player, it is important to enhance competition among banks for government deposits. This will ultimately contribute to a more stable financial system. Given the relatively weak balance sheets and performance of state-owned banks in recent years, and the ongoing efforts to clean up balance sheets of state-owned financial institutions, full or partial divestiture of state-owned banks could be a medium-term objective for the Government. However, this should only be pursued when the financial sector is more stable, and the efficiency and performance indicators of state-owned banks have improved. Thus, sequencing plans for divestiture, after addressing immediate financial sector performance issues, could improve the attractiveness of these banks to private investors.

156 KPMG and ADB. 2021. "Credit Risk and NPL Management for Bhutan. NPL Management Strategy Report." https://www.adb.org/sites/default/files/project-documents/51252/51252-004-tacr-en_2.pdf



Bolstering corporate governance and risk management frameworks is essential to improving good corporate governance practices. In 2020, the RMA introduced the Corporate Governance Rules and Regulations (CGRR) to promote sound governance by encouraging high standards of governance principles. According to Clause 15 of the CGRR, there should be a transparent accountability framework to ensure effective accountability of the board and senior management positions in FIs. The regulations limit the number of directors to seven, including the chairperson and CEO, with at least two being independent directors. However, this limitation poses challenges for FIs in forming board-level committees, such as, governance, risk, and audit with sufficient directors. To address this issue, revising regulations may be necessary to ensure an optimal number of board members in these committees, thereby improving good governance practices.

3.4.2. Deepening financial intermediation

Strengthening the CIB, by expanding the coverage of service providers and data systems, is essential to reducing collateral-based lending. The utilization of credit information by lenders appears to be limited.¹⁵⁷ Expanding the coverage of information is critical to developing a comprehensive credit history and implementing a new credit scoring system in the country. Presently, only FIs, several MFIs, and the utility company report to the CBI. There is significant potential to expand the coverage of CIB by creating an enabling environment for other financial service providers to share information. This expansion would help reduce information asymmetry and enhance the credit history database. Looking ahead, the CIB could consider incorporating the land record system and the Road Safety Transport Authority in its coverage of service providers. Making CIB reports mandatory during loan origination would also help mitigate the risks of NPLs. The CIB is working on a credit scoring model specifically for retail borrowers, which will be integrated with the credit reports. However, these reports are primarily used as compliance tools rather than comprehensive credit assessment tools.

A review of the design of the PSL scheme can improve its effectiveness by tackling disincentives to lend to the CSI sector. A major challenge is that many projects are rejected due to poor credit history and lack of bankable projects. Banks have raised concerns about restrictions on their ability to determine the lending conditions under the PSL, such as interest rate caps, loan tenures, payment structures, and mandatory insurance coverage for agricultural lending instead of collateral requirements. These concerns are compounded by the lack of credit risk-sharing arrangements and institutional capacity to serve the CSI sector. While the PSL approach allows banks to make the final decision in the credit approval process, there is a need to review the role of all commercial banks involved in the PSL initiative. This includes addressing issues related to generalized lending obligations, the absence of a risk-sharing framework, operational constraints, pricing limitations, technical capacity, and prudential norms and regulations. The aim is to eliminate disincentives for lending to the CSI sector.

A sustainable credit guarantee scheme can effectively alleviate credit constraints in risky sectors, such as MSMEs. However, there are potential risks associated with the limited guarantee coverage period of three years under the NCGS, as loans are not collateralized after the sunset clause. To ensure the success of such schemes, it is crucial to improve monitoring and support mechanisms. This can be achieved by reviewing the design, guarantee coverage period, guarantee ratio system, and fees of the schemes. Additionally, enhancing coordination between the scheme, CIB, and FIs, in assessing and managing loans, is essential. To address concerns raised by banks regarding the temporary nature of the NCGS, it could be made permanent and capitalized separately. This would provide guarantees for the entire loan duration, ensuring sustained lending support. Further, simplifying the current claims process and expanding the scope of the NCGS would contribute to its effectiveness.

Implementing a robust collateral valuation system is crucial to mitigating loan losses and safeguarding banks. The quality and accurate valuation of collateral plays a significant role in securing banks against potential loan losses. In order to achieve this, the RMA can develop a comprehensive framework for collateral valuations, which is in accordance with international accepted standards, and conduct capacity building on collateral valuation for lenders and supervisors. In addition, having an independent valuer will be vital during legal settlements, as borrowers generally seek a higher value for the surrender of their collateral.

¹⁵⁷ The CIB is governed by the Credit Information Bureau Rules and Regulations, 2017, issued by the RMA. It currently provides consumer and commercial information through an automation platform.

Facilitating access to international finance for domestic firms can support private sector development and firm growth. Expanded ECB for the larger companies could free up access to domestic financing for the smaller companies and thereby enhance financial inclusion. It could also reduce the maturity mismatches of domestic banks (banks are financing long-term assets with very short-term funding, i.e., deposits) and concentration risks (banks are relatively small, therefore taking larger export-oriented projects could create industry concentration risks in their balance sheets) by taking some loans off the banking sector balance sheet. Although the government has already made strides in easing ECB for the real sector, further medium-term reforms could be beneficial. These reforms include opening the banking sector to ECB under strict regulatory oversight, easing foreign exchange conditions to allow borrowers more flexibility in meeting repayment obligations, for instance by considering alternative measures for hedging, such as by focusing on the production of tradable goods. Moreover, raising the debt-equity ratio for ECB beyond the current 3:1 limit could support projects with higher leverage, potentially with sector-specific variations. Regulations might also permit shorter-term ECBs below a certain level or for borrowers with a natural hedge in foreign exchange earnings.

The adoption of digital technologies can enhance efficiency and boost financial inclusion. Digitized assets and emerging technology are shaping the financial services landscape. Banks can leverage digital technology to improve their services by reducing overhead costs, eliminating the need for branch expansion. This is also vital for building capacity to address the skills gap and promoting digital financial literacy. The drive towards digitalization will facilitate validation of digital signatures and digital documents, which can modernize the financial industry.

3.4.3. Bolstering climate finance

Strategy and coordination

The Green Finance Roadmap lacks some specific details, and a comprehensive coordination mechanism is necessary to support its implementation. To promote a more coordinated approach and build a strong and efficient domestic green finance market, it is important to establish an overarching coordination mechanism that involves all financial sector authorities, relevant government bodies, and the financial sector as a whole. The establishment of the National Sustainable Finance Committee is a positive step in this direction. This committee will include all authorities, such as the RMA, relevant departments at the Ministry of Finance, National Environment Commission, Royal Stock Exchange of Bhutan (RSEB), and the Bhutan Chamber for Commerce and Industries. It will also try to work closely with international partners and networks in the sustainable finance field. As a next step, the committee could focus on developing a detailed work plan that includes specific deliverables. Where relevant, technical subgroups (comprising both public and private sector) could be established to support implementation.

Developing a national climate finance strategy can provide additional clarity on investment objectives and offer assurance to investors about the Government's long-term policy direction, including priority investment sectors. For Bhutan, it would be important to consider the potential sources of financing required to meet its adaptation and resilience objectives. This is especially important as adaptation investments require different mechanisms, incentives, and actors, compared to mitigation financing. Building institutional capacity across the government is necessary to develop innovative approaches that can unlock finance for adaptation and resilience projects.

Building skills and capacity

Enhancing awareness of climate-related and environmental risks and opportunities will be critical for supporting the implementation of the Green Finance Roadmap and the development of the green finance market. This can be achieved by developing a detailed plan to identify the specific training needs of authorities and the sector. It is important to identify relevant partners to engage in addressing specific topics. There are training and capacity-building opportunities, which can be accessed by the public and private sectors, including the Central Banks and Supervisors Network for Greening the Financial System (NGFS). The NGFS supports central banks, prudential supervisors, and policymakers to take steps to green the financial sector. Its workplan includes micro prudential supervision, scenario analysis, monetary policy, and other topics related to the greening of central bank activities, including portfolio management. Given that the NGFS is currently the primary mechanism for international coordination on the topic, the RMA may seek membership of the NGFS to benefit from its deep expertise and share best practices with other members.



Climate-related risks and supervisory practice

Conducting a climate-related or environmental risk assessment can help identify the main climate-related and environmental financial risks and assess their potential impact on the Bhutanese financial sector. The insights gained from this assessment can guide the development of a suitable approach to incorporate these risks into the RMA's supervisory practices, including internal organization and governance structure. Further, the RMA could provide supervisory guidance to FIs on climate and environmental financial risks in important areas such as corporate governance, strategy, risk management, scenario analysis and stress testing, and disclosure.¹⁵⁸ Such assessments primarily focus on the financial risks faced by institutions; they could begin with a high-level exposure analysis, progressing to more advanced scenario analysis as capacity and data improve. Given Bhutan's reliance on hydropower and low per capita Greenhouse Gas (GHG) emissions, the assessment of transition risk may be relatively less important at present. However, the scope of assessments can be expanded to include other environmental and social risks, including nature-related and biodiversity risks.

Greening central bank activities

Internationally, there is growing interest in greening the central bank's activities and operations. Examples of greening central bank operations include adopting sustainable and responsible investment practices in portfolio management, disclosing climate-related information, and greening of monetary policies (e.g., through credit operations, collateral policies and asset purchase). However, many of these options are still under review by the international central bank community, including the NGFS. While some of these options may be of less immediate relevance to Bhutan and the RMA, they could integrate climate-related considerations in the macroeconomic analysis and forecasting, which can inform future monetary policy interventions. In addition, the RMA is considering direct green credit policy instruments (for example, subsidized loan rates for priority sectors, interest rate discounts, differentiated reserve requirements). Although this intervention is less tested, it could be effective in redirecting financing flows, provided it aligns with the Central Bank's mandate and does not compromise other financial stability objectives.

Transparency, disclosure, and reporting

Enhancing market transparency is crucial to ensuring the efficient allocation of capital for Bhutan's climate and environmental financing objectives. Investors and lenders need adequate information on climate-related and environmental risks and opportunities to understand, price and manage the risk in their portfolios and operations. The RMA, Ministry of Finance, and RSEB have launched several initiatives, including reporting and disclosure requirements for financial institutions, and Environmental Social and Governance (ESG) reporting standards under the support of Global Reporting Initiative (GRI), to align with international best practice. As a next step, the RMA and other stakeholders could develop a plan to embed the national green taxonomy in relevant regulatory and policy frameworks, to mainstream green considerations in the financial sector. This could include green bond guidelines or green finance-related reporting frameworks.

Greening financial institutions

The National Development Bank (NDB), or other domestic public financial institutions, can help address the financing gap to achieve climate and environmental objectives. It is important to ensure that these institutions, including the BDB, have the appropriate mandate and policy objectives to promote green lending and investment.¹⁵⁹ NDBs generally have a good understanding of local sectors, enabling them to target technical support and private investments effectively. It is therefore worth considering if public banks such as the BDB can enhance private finance by offering de-risking instruments like credit enhancements and guarantees. By explicitly incorporating environmental and climate objectives into their mandates, these institutions can ensure that financing flows align with green objectives. In the case of BDB, this would involve a specific reference to sustainable low-emissions agriculture in its mandate.

¹⁵⁸ The Basel Committee on Banking Supervision has just published its "Principles for the Effective Management and Supervision of Climate-Related Financial Risks," providing a global baseline standard.

¹⁵⁹ BDB is a DFI with a focus on rural financial inclusion. The Bhutan Development Finance Corporation was established in 2010 with the social mandate to cater to the financial needs of the micro, small and medium enterprises, with a special focus on agricultural development. Some of the challenges faced by the BDB includes high NPLs and funding costs.

Green financial tools and instruments

New blended finance instruments could leverage public and concessional finance to mobilize private capital for green investments. Mechanisms such as risk sharing instruments, guarantees, and funds that leverage philanthropic capital, can help bridge the financing gap in Bhutan's green development objectives. In cases where private investments are not commercially viable, suitable financial structuring through blended finance can unlock private investment. This can be made possible by addressing perceived or actual risks with new technologies or pioneering projects. By providing flexible capital and favorable terms, blended finance, tailored to the local context, can mitigate risks and re-balance the risk-reward profiles of impact investments, making them commercially viable over time.

Green bonds can mobilize long-term capital flows. Regulators and policymakers have several tools at their disposal to promote the development of green bond markets and stimulate domestic bond issuance, some of which have already been covered in the Green Finance Roadmap. The adoption or development of green bond guidelines and standards, aligned with internationally recognized frameworks like the International Capital Market Association's (ICMA) Green Bond Principles, would ensure comparability on an international level. While green bonds may initially have higher transaction costs due to compliance independent review and reporting requirements, fiscal incentives can help offset these costs for first-time or small issuers, facilitating market entry. To lead by example and signal Bhutan's commitment to meeting its climate goals and green growth objectives, the Government could also consider issuing a green sovereign bond. This can support the development of the local green finance market and diversify the investor base.

To scale-up private finance and develop green financial instruments, the authorities could develop a detailed plan for the operationalization of its green finance objectives, which is outlined in the Green Finance Roadmap. To facilitate this process, gaining more insights into the barriers that prevent the flow of financing to where it is needed, would be beneficial in tailoring the instruments to the local context. Specific consideration should be given to mobilizing adaptation financing, which can be particularly challenging.

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Annexes

Annex 1: Growth accounting of the hydro and non-hydro sectors

Growth accounting using two sectors

The economy consists of two sectors, hydro and non-hydro. Aggregate output (Y_t) during period t is the sum of the two sectoral outputs (as in national accounts):

$$Y_t = Y_{H,t} + Y_{N,t}$$

$Y_{H,t}$: Output of the hydro sector (function of capital and productivity)

$Y_{N,t}$: Output of the non – hydro sector (function of labor, capital, and productivity)

Decomposing hydro sector growth

Hydro output growth ($g_{Y,H,t}$) is decomposed into two components:

$$g_{Y,H,t} = (1 + g_{A,H,t})(1 + g_{K,H,t}) - 1$$

$g_{A,H,t}$: growth of hydro sector TFP

$g_{K,H,t}$: growth of capital stock used in hydro production

Decomposing non-hydro sector growth

Non-hydro output growth ($g_{Y,N,t}$) is decomposed into four components:

$$g_{Y,N,t} = (1 + g_{A,N,t}) [(1 + g_{s,t})(1 + g_{L,t})]^\beta (1 + g_{K,N,t})^{1-\beta} - 1$$

$g_{A,N,t}$: growth of non – hydro sector TFP

$g_{s,t}$: growth of human capital

$g_{L,t}$: growth of labor stock

$g_{K,N,t}$: growth of capital stock used in non – hydro production

β : labor intensity of production technology (time invariant)

Decomposing Labor Growth

Labor growth ($g_{L,t}$) can be further decomposed into three components:

$$g_{L,t} = (1 + g_{\omega,t})(1 + g_{\rho,t})(1 + g_{P,t})$$

$g_{\omega,t}$: growth in working age population ratio

$g_{\rho,t}$: growth in labor force participation rate

$g_{P,t}$: growth in population

Substituting the labor growth equation into the non-hydro sector growth equation, the non-hydro sector growth ($g_{Y,N,t}$) becomes:

$$g_{Y,N,t} = (1 + g_{A,N,t}) [(1 + g_{s,t})(1 + g_{\omega,t})(1 + g_{\rho,t})(1 + g_{P,t})]^\beta (1 + g_{K,N,t})^{1-\beta} - 1$$

$g_{A,N,t}$: growth of non – hydro sector TFP

$g_{s,t}$: growth of human capital

$g_{w,t}$: growth of working age population

$g_{p,t}$: growth of labor force participation rate

$g_{P,t}$: growth of population

$g_{K,N,t}$: growth of capital stock used in non – hydro production

Hydro Spillovers

Capital expenditure in the hydro sector (investment) generates income in non-hydro sector, for example, through supply of goods (e.g., construction materials) and services (e.g., labor used in construction).

In the absence of hydro investment ($I_{H,t}$), non-hydro output in period t equals to $\tilde{Y}_{N,t}$:

$$\tilde{Y}_{N,t} = Y_{N,t} - I_{H,t}$$

Recover the hydro spillover to non-hydro growth using the above expression:

$$g_{Y,N,t} = \frac{\tilde{Y}_{N,t+1} - \tilde{Y}_{N,t}}{\tilde{Y}_{N,t}} + \frac{I_{H,t+1} - I_{H,t}}{\tilde{Y}_{N,t}}$$

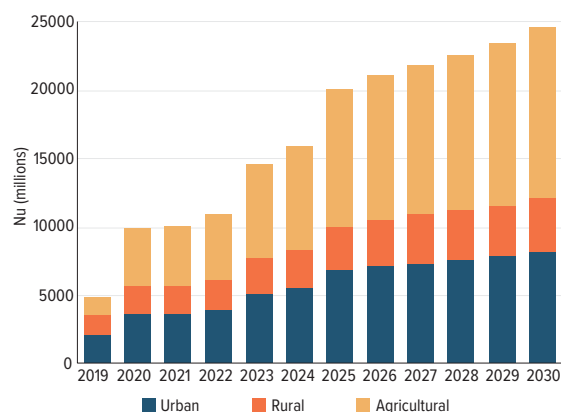
Where the first part represents the core non-hydro growth, and the second part represents the spillover effect.

Annex 2: Detailed CGE scenario results

Basic Income Grant (BIG)

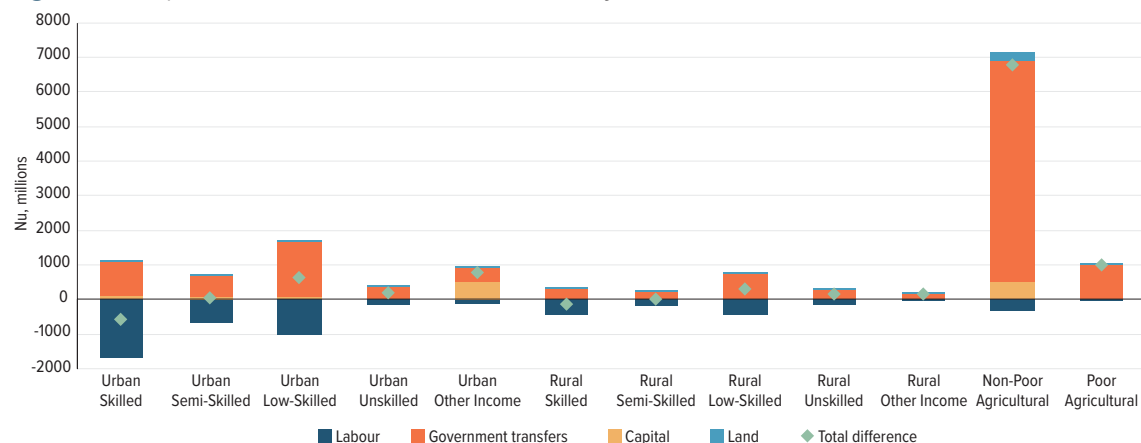
In Scenario 4 (hydro-led with fiscal transfers), revenues are channelled into (untargeted) fiscal transfers in the form of a BIG to households. In this model, growth is driven through private spending. The BIG is assumed to be untargeted and unweighted, such that all people receive the same per capita transfer. The BIG changes both the size (transfers increase from 4,735 million Nu in 2019 to 24,542 million Nu in 2030) and distribution of government transfers to households (Figure 118). While agricultural households accounted for 27 percent of total government transfers in 2019, their share increases to 51 percent in 2030 under the BIG, reflecting the large transfers to agricultural households under the BIG scenario due to their share in the population (Figure 119).

Figure 118: Value and composition of government transfers to households including BIG, 2019-2030



Source: CGE model.

Figure 119: Impact of the BIG on household income by source, 2030



Source: CGE model. Note: The graph shows the difference in average household income by source between 2020 and 2030 (\$4_HydroLed_BIG minus the reference scenario).

Overview of the economic development under the different scenarios

Table 7: Economic development in different scenarios, 2030

			s2_HydroLed Reference Scenario		S1_NoAddHydro	S3_HydroLed_Div	S4_HydroLed_BIG
			annual compound growth 2019-2030	Values 2019-2030	Annual compound growth 2019-2030. Shading shows percentage change compared to S2_Hydroled		
cGDP	Macro	GDP	4.1%		3.4%	4.5%	4.0%
cABSORP		Domestic absorption	2.6%		3.3%	3.3%	2.3%
cVAAgr	Value added	Agriculture	1.1%		1.9%	1.7%	1.9%
cVANat		Natural resources	1.4%		2.5%	2.4%	2.3%
cVAFd		Food and beverages	0.8%		1.4%	1.3%	1.4%
cVAInd		Industry	2.7%		4.1%	3.6%	3.6%
cVAUti		Utilities	11.0%		5.0%	11.3%	11.1%
cVACon		Construction	3.8%		3.8%	4.6%	3.7%
cVASer		Services	3.0%		3.6%	3.2%	2.1%
cEMPAgr	Labour demand	Agriculture	2.5%		2.6%	3.2%	2.6%
cEMPNat		Natural resources	-0.8%		1.3%	1.1%	1.6%
cEMPFd		Food and beverages	2.3%		1.9%	2.8%	2.0%
cEMPInd		Industry	0.8%		2.5%	2.5%	2.5%
cEMPUti		Utilities	7.6%		2.6%	8.3%	8.4%
cEMPCon		Construction	2.4%		2.9%	4.0%	3.6%
cEMPSer		Services	2.0%		2.3%	2.1%	1.0%
cCAPAgr	Capital demand	Agriculture	-1.8%		-1.6%	-1.6%	-1.7%
cCAPNat		Natural resources	1.5%		1.7%	2.2%	1.6%
cCAPFd		Food and beverages	1.2%		1.4%	1.9%	1.3%
cCAPInd		Industry	1.8%		2.1%	2.5%	1.9%
cCAPUti		Utilities	7.8%		1.7%	8.0%	7.9%
cCAPCon		Construction	1.3%		1.5%	2.0%	1.4%
cCAPSer		Services	1.8%		2.1%	2.4%	1.9%
cCAPHydro		Hydro	7.8%		1.7%	8.0%	7.9%
cCAPNonHydro		Non-hydro	1.4%		1.7%	2.1%	1.5%
cLABAgri	Factor supply	Agriculture	2.6%		2.6%	3.3%	2.6%
cLABUnLow		Unskilled & low-skilled	2.3%		2.3%	2.9%	2.3%
cLABSemi		Semi-skilled	2.5%		2.5%	3.2%	2.5%
cLABHigh		Highly-skilled	2.6%		2.6%	3.2%	2.6%
cCAP		Capital	3.1%		1.7%	3.6%	3.2%
cLAND		Land	0.9%		0.9%	0.9%	0.9%

		s2_HydroLed Reference Scenario			S1_NoAddHydro	S3_HydroLed_Div	S4_HydroLed_BIG
		annual compound growth 2019-2030	Values 2019-2030	Annual compound growth 2019-2030. Shading shows percentage change compared to S2_Hydroled			
cWFAgri	Factor returns	Agriculture	-1.0%		-0.3%	-1.1%	-0.4%
cWFUnLow		Unskilled & low-skilled	1.1%		1.0%	0.6%	0.3%
cWFSemi		Semi-skilled	0.9%		1.0%	0.2%	-0.2%
cWFHigh		Highly-skilled	1.3%		1.1%	0.4%	0.1%
cWFCAP		Capital	1.8%		1.9%	1.9%	2.0%
cWFLAND		Land	-0.03%		0.6%	0.3%	0.4%
cHEXPUrban	Household consumption	Urban	0.1%		4.0%	2.5%	0.1%
cHEXP Rural		Rural	2.5%		3.5%	3.2%	2.9%
cHEXPUnLow		Unskilled & low-skilled	2.6%		3.2%	3.1%	3.2%
cHEXP Semi		Semi-skilled	2.5%		3.9%	3.3%	2.5%
cHEXP Skilled		Highly-skilled	2.2%		4.5%	3.5%	1.8%
cHEXP PoorAgri		Poor agricultural	1.5%		2.0%	1.9%	6.7%
CHEXP NonPoorAgri		Non-poor agricultural	1.6%		2.4%	2.2%	3.4%
cElecGen	Electricity	Electricity output	7.5%		1.4%	7.7%	7.6%
cElecPrice		Electricity price	4.7%		3.9%	4.7%	4.6%
cElecExp		Electricity exports	8.2%		1.7%	8.3%	8.3%
cElecDom		Electricity domestic sales	4.0%		-0.2%	4.2%	4.0%
cHydroRev	Govt	Hydro revenue	6.6%		3.9%	7.1%	6.8%
cGovCons		Government consumption	5.1%		3.5%	4.0%	0.6%

Key:	< -50%	-10% to -50%	Up to -10%	Up to 10%	10% to 50%	>50%
Percentage change relative to S2_HydroLed reference scenario						

Example: Annual compound growth in GDP is 0.4 percentage points higher in S3 than the reference scenario (4.5 percent vs. 4.1 percent). The annual compound growth rate is between 10 percent and 50 percent higher in S3 than the reference scenario as indicated by the shading.



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