

Policy Brief

November 2022



EXECUTIVE SUMMARY

The policy brief was developed in partnership with the Ministry of Economy and Finance (MEF) to review Cambodia's 2022 to 2025 socio-economic outlook with a focus on economic growth, poverty and employment, namely in view of rising fuel, food and fertilizer prices and the global economic slowdown.

The assessment employs a Dynamic Computable General Equilibrium (DCGE) model. To capture the implications of the changes, four sets of simulations were carried out, namely, i) a **business-as-usual (BAU) scenario**, building on the assumption that there are no demand or price shocks, and that the economy is poised to attain post-

ECONOMIC AND SOCIAL IMPACT ASSESSMENT OF COVID-19 AND WAR IN UKRAINE ON CAMBODIA: Dynamic CGE Simulation Exercise

pandemic, pre-Ukraine war gross domestic product (GDP) growth rates, similar to those estimated by the MEF macroeconomic framework at the beginning of 2022 (ranging from 5.4 percent in 2022 to 7.3 percent in 2025); ii) a **commodity price shock scenario** (Simulation 1), which includes price increases of food, oil and fertilizer; iii) a **commodity price shock and demand shock scenario** (Simulation 2), which extends the commodity price increases by incorporating demand shocks on three fronts: Cambodian exports, tourist arrivals and construction sector investments; and iv) a **commodity price shock and demand shock with government intervention scenario** (Simulation 3), which assesses the impacts of the government's proposed interventions for 2022 and 2023 detailed in Table 3.

The simulation outcomes suggest the following:

- In Simulation 1, **the overall GDP growth rate is expected to decelerate to 4.1 percent in 2022** compared to the BAU growth rate of 5.4 percent (i.e., without the war in Ukraine),

indicating that the commodity price shock may cause **an economic loss of approximately 1.3 percentage points of GDP in 2022**. GDP growth may increase to above 7 percent annually in the period 2023-2025, reflecting the base effect in 2022, in which a small-sized economy tends to grow at a fast pace.

- In Simulation 2, the **GDP growth rate may decline further to 3.9 percent in 2022** compared to the BAU growth rate of 5.4 percent, showing an **economic loss of approximately 1.5 percentage points of GDP in 2022** due to the commodity price increase shock and demand shock. In 2023 and 2024, the GDP growth rates are expected to remain lower than the BAU growth rates, estimated at 4.4 percent and 6.5 percent respectively, due to combined demand and price shocks. However, the GDP growth rate is likely to converge to the BAU growth rate of around 7.5 percent in 2025.
- In Simulation 3, the government socio-economic interventions, if administered effectively, are likely to have beneficial effects on growth, employment, and poverty. **The GDP growth in 2022 may recover from 3.9 percent (Simulation 2) to 4.9 percent with the government stimulus (Simulation 3)**. However, it remains 0.5 percentage points off from the 5.4 percent growth rate projected in the BAU scenario, which matches MEF projections. **In 2023, the GDP growth rate is likely to recover to 5.2 percent.**
- The effect of government socio-economic interventions on broad sector growth is also evident. Since a significant share of the interventions would be channelled through social sectors and programmes, the interventions appear to have the strongest effect on the service sector. Due to the inter-dependence between sectors, the other sectors of the economy are also affected by interventions, and particularly in the agriculture sector due to cash transfer provided to poorer households who have higher the propensity to spend on agricultural products. The growth rate of services may increase to 4.6 percent in 2022 and 7.8 percent in 2023 under Simulation 3, compared to 2.4 percent and 5.5 percent respectively under Simulation 2. Meanwhile, the contraction of the agriculture sector's growth rate of 1.4 percent in 2022 and 0.9 percent in 2023 under Simulation 2 is expected to decrease to 0.9 percent and 0.4 percent respectively under Simulation 3. This is mainly due to reduced input prices (e.g., fertilizer) and an increase in domestic demand for agricultural products such as food, which benefits from overall income recovery and an increase in household income.
- As a result of the expansion of the economy **with the government stimulus in 2022, the unemployment rate is 1.3 percent in 2022** while it is estimated at 1.5 percent without government stimulus (Simulation 2). In 2023, unemployment rate may drop to 1.6 percent under Simulation 3 from 1.9 percent under Simulation 2.
- Gains in GDP growth also have a positive effect on poverty. Therefore, **the poverty rate in 2022 may drop from 15.7 percent under Simulation 2 to 15.2 percent under Simulation 3**, which falls short by 0.2 percentage points from the projected BAU poverty rate of 15.0 percent. In 2023, the poverty rate may continue to **decline from 13.9 percent under Simulation 2 to 13.4 percent under Simulation 3**.

RECOMMENDATIONS:

Uncertainty shocks such as COVID-19 and the war in Ukraine have reversed development gains and spurred the need to build the country's capacity to absorb shocks and protect the most vulnerable. The following policy recommendations may be considered:

- **Double down on investments in human development, particularly education and health.** Universal health care and education should be adopted with a progressive fee structure that makes these essential services accessible and affordable to all. Countries that invested in public health and education have recovered faster from the pandemic. Investing in human capacities can boost productivity, which will in turn drive sustained economic growth.
- **Further strengthen the social protection system.** The surge of social protection in Cambodia in the wake of the COVID-19 pandemic, such as the COVID-19 Cash Transfer Programme for Poor and Vulnerable Households, has been effective. Further investing in, for example, targeted basic income and social protection for the poorest and most vulnerable people, with particular attention to women, will help reduce inequalities and enhance resilience. This will also support gradual movement towards universal access to social protection. UNDP has been piloting with the General Secretariat for the National Social Protection Council and the Ministry of Social Affairs, Veterans and Youth Rehabilitation an asset-based social protection, also known as graduation based social protection, with productive pathways such as provision of agricultural inputs, technical training, financial literacy and income generation opportunities. Social and Behavioural Change Communications could encourage positive behaviours, such as promoting good and healthy diets.
- **Foster an ecosystem for inclusive innovation.** This may include innovation on many fronts from the production of goods and services to community development – technological, economic, and social innovation – to enable the country to increase its competitiveness and to leapfrog on its development path.
- **Increase the share of domestic energy resources and its diversification.** Increased dependence on energy imports is leading to a sharp increase in inflation, therefore affecting the GDP. Energy transition towards maximising the use of renewable resources such as solar energy, modal shift such as electric mobility and energy efficiency will boost economic competitiveness, create new jobs domestically, and promote the country's green credentials.
- **Promote Site-Specific Nutrient Management (SSNM).** The SSNM will increase fertilizer use efficiency, reduce greenhouse gas emission (GHG) while maintaining or enhancing crop yields. The SSNM will help farmers reduce costs of production amidst fertilizer price increase. The adoption of SSNM at scale requires government investment to generate soil properties, conduct on-farm nutrient trials and soil tests, develop capacity to monitor crops' nutrient status, decision support systems and farmer-friendly tools and techniques accessible to farmers and farm advisors: right products, right rate, right time, and right place.
- **Scale up agroecology and nature-based solutions.** The growing pressure on natural resources such as on soils, water and biodiversity and climate risks require a shift from a high-external inputs and resource intensive production system towards agroecology to optimise mutually beneficial interactions between plants, animals, humans, and the environment. Fostering local organic fertilizer production and trading such as composts will contribute to scaling up agroecology.

1. INTRODUCTION

The sense of optimism for a steady economic recovery from the COVID-19 pandemic since late 2021 has diminished as the world faces the emergence of multiple crises. Despite remarkable progress in vaccination rollout and COVID-19 containment, the disease remains a threat to social and economic activity and stability, causing disruptions to global and regional supply chains. Moreover, with the major economy of China adopting a ‘zero-COVID’ approach by imposing lockdowns and mobility restrictions in major commercial hubs, global and regional value chains and trading activity have also been disrupted.

Supply chain disruptions have further worsened since early 2022, when Russia began its military offensive against Ukraine on 24 February. The war has sent economic shock waves throughout the world, resulting in a reduction in the supply of fuel, food, and commodities, and consequently in mounting prices. This has led to rising inflation rates and economic slowdown across developed and developing economies alike. Given the rise in inflation rates escalated by the war’s impact, the pace and size of interest rate hikes have been accelerated by many economies – especially large and advanced economies – resulting in a higher downside risk of slower economic activity. The global gross domestic product (GDP) growth in 2022 and 2023 is anticipated to decline to 2.8 percent and 3.4 percent respectively, which is 0.8 and 0.2 percentage points lower than the initial forecast of 3.6 percent.¹

Cambodia is not shielded from these layered crises. As a small, export-dependent economy, the country is highly susceptible to external shocks including the war in Ukraine and extreme weather events. Cambodia’s economy recovered by a marginal growth rate of 3 percent in 2021 after experiencing a sharp contraction of 3.1 percent in 2020 because of the COVID-19 pandemic. The recent emergence of overlapping crises has created an environment that is both complex and uncertain, which may affect the prospects of Cambodia’s socio-economic recovery and its return to a pre-pandemic growth path and development.

Against this backdrop, this policy brief aims to assess the socio-economic outlook for Cambodia in terms of GDP growth, employment, and poverty from 2022-2025. It focuses on the impact of rising fuel, food, and fertilizer prices and of the global economic slowdown. The findings are used to inform the design of policy options and discourse for the formulation of interventions to tackle the impact of the crises and to promote inclusive and sustainable growth.

2. IDENTIFIED IMPACT CHANNELS

The compounding crises are likely to substantially affect Cambodia’s economy. Despite limited direct impact from the war in Ukraine, the Cambodian economy is affected through various channels.² This study focuses solely on key transmission channels of the impact, including rising prices of fuel, food and fertilizer and a slowdown of the global economy, resulting in lower-than-expected tourist arrivals and foreign direct investment (FDI). Secondary effects³ of the shocks are captured by the model.

1. International Monetary Fund, “World Economic Outlook: War Sets Back the Global Recovery”, (April 2022).

2. Poch, “Analytical Note on the Potential Impact of the Russia-Ukraine War on the Cambodian Economy”, (May 2022).

3. The secondary effects are spill over effects on other sectors of the economy which did not experience shocks directly or were provided with fiscal or similar assistance.

2.1. Commodity Price Increase

The identified channels of price increases along with the extent of shocks and their timeframes are summarized below. This information is used to design *Simulation 1: Commodity price shock*.

Table 1: Commodity price increases and implications for Cambodia

2022 Commodity		
Food Prices	Oil Prices	Fertilizer Prices
<p>In its May 2022 market update for Cambodia, the World Food Programme (WFP) referred to the Food and Agriculture Organization Food Price Index (FFPI) to capture the global food price increase. The FFPI was 22.8 percent higher year-over-year.</p> <p>The main drivers of this FFPI increase were the soaring global price of cereals (e.g., the wheat price increased by 60 percent between January and June 2022, according to the Organisation for Economic Co-operation and Development (OECD)) and vegetable oils (e.g., by 30 percent between January and June 2022, according to OECD). Recent data suggests that as prices of food items started to decline towards the end of the year (or second half of the year), the FFPI in 2022 compared to 2021 may be stabilized at 20 percent.</p> <p>In this simulation we consider a 20 percent increase in food prices for 2022 over the business-as-usual (BAU) scenario.</p>	<p>Quoting Ministry of Commerce data in its May 2022 market update, WFP suggested that the gasoline and diesel prices increased by 45 percent and 67 percent respectively on a year-over-year basis. However, the prices of both gasoline and diesel may be stabilized to lower levels than found in May 2022.</p> <p>In this simulation we consider a 40 percent increase in gasoline prices and a 55 percent increase in diesel prices for 2022 over the BAU scenario.</p>	<p>The average prices of imported fertilizers rose by 32.9 percent from US\$324 per tonne in the first quarter of 2021 to \$431 per tonne in the first quarter of 2022.⁴ Although there is a possibility of decline in the fertilizer price in the second half of 2022, the price reduction may be small as the gas price will remain high and there will be continued supply disruptions from Russia and Ukraine, who are major exporters of fertilizer.</p> <p>In this simulation we consider a 50 percent increase in fertilizer prices for 2022 over the BAU scenario.</p>
2023 Commodity		
Food Prices	Oil Prices	Fertilizer Prices
<p>Global reports by the World Bank, International Monetary Fund and OECD project a reduction in inflation to 3.5 percent in 2023 compared to 7 percent in 2022. In line with these projections, a food price increase of 10 percent in 2023 over the BAU scenario is assumed.</p>	<p>We consider a 20 percent increase in gasoline prices and a 25 percent increase in diesel prices for 2023 over the BAU scenario.</p>	<p>We consider a 20 percent increase in fertilizer prices for 2023 over the BAU scenario.</p>
2024 Commodity		
Food Prices	Oil Prices	Fertilizer Prices

4. Based on data from the General Department of Customs and Excise (GDCE) of the Ministry of Economy and Finance (MEF).

It is assumed that prices converge to the BAU prices. Factors behind this assumption include the fact that during the last five months of 2022 food prices have fallen in the global market due to improvements in supply conditions, resumption of exports from food exporters in Ukraine and a better wheat harvest in Russia and North America. The vegetable oil, sugar, dairy and meat price indices all fell, partly reflecting improved supplies. Given the above factors among others, FAO expects a further drop in food prices.⁵

We consider a 10 percent increase in gasoline prices and a 15 percent increase in diesel prices for 2024 over the BAU scenario.

Prices converge to the BAU prices. De-escalation of the war in Ukraine and resumption of exports from Russia and Ukraine are likely to help stabilize fertilizer prices.

2025 Commodity		
Food Prices	Oil Prices	Fertilizer Prices
Prices converge to the BAU prices in 2025.	Prices converge to the BAU prices in 2025.	Prices converge to the BAU prices in 2025.

Sources: World Food Programme, “Cambodia: Market Update, WFP and Agricultural Marketing Office of the Ministry of Agriculture, Forestry and Fisheries”, (May 2022); OECD, “OECD Economic Outlook, Volume 2022 Issue 1”, (June 2022); Food and Agriculture Organization, “FAO Food Price Index drops for the fifth consecutive month in August”, (2 September 2022).

2.2. Global slowdown and demand shocks

Along with price increases, the global income slowdown may also affect Cambodia – particularly, Cambodian export growth, tourist arrivals and construction sector investments. The identified channels of demand shocks along with the extent of the shocks and their timeframes are summarized below. These inputs are used to design *Simulation 2: Commodity price shock and demand shock*.

Table 2: Demand shocks and implications for Cambodia

2022 Sector		
Export Growth	Tourist Arrivals and Tourism Revenue	Construction Sector*
During the first quarter of 2022, goods exports rose to \$4.8 billion, up by 26 percent on the previous year. In 2022, overall export growth could be around 25 percent year-over-year (base simulation). Although the global slowdown may reduce export growth, Cambodian exporters are optimistic that the global income slowdown will not affect export growth in 2022.	Data between January and May 2022 suggests that tourist arrivals are at about 12 percent of their 2019 level. For the entire year, they were expected to reach 20 percent of the 2019 level. However, due to the global slowdown, they may not reach the 20 percent level and may settle at 15 percent of the 2019 level. Thus, in effect, there may be a 5 percent drop in expected tourist arrivals over the BAU scenario.	According to the Ministry of Land Management, Urban Planning and Construction (MLMUPC), there were 1,984 projects approved in the first half of 2022, equivalent to \$1,041 billion. This represented a substantial decline of approximately 50 percent compared to the same period in 2021.

5. Food and Agriculture Organization, “FAO Food Price Index drops for the fifth consecutive month in August”, (2 September 2022).

No export growth reduction is assumed for 2022.		For 2022, a 25 percent reduction in construction investments is assumed.
2023 Sector		
Export growth	Tourist arrivals and tourism revenue	Construction sector*
<p>The global income slowdown may affect export growth in Cambodia for 2023.</p> <p>Accordingly, for 2023, a reduction in export growth of 7 percent over the BAU scenario is assumed.</p>	<p>It is expected that tourist arrivals may reach 30 percent of the 2019 level in 2023 according to the base simulation. However, due to the global slowdown, the 30 percent level may not be reached, and may instead settle at 20 percent of the 2019 level. In effect, there may be a 10 percent drop in expected tourist arrivals compared to BAU.</p>	<p>For 2023, a 20 percent reduction in construction investments is assumed over the BAU scenario.</p>
2024 Sector		
Export growth	Tourist arrivals and tourism revenue	Construction sector*
<p>For 2024, a reduction in export growth of 3 percent over the BAU scenario is assumed.</p>	<p>For 2024, it is expected that tourist arrivals may reach 50 percent of the 2019 level, according to the base simulation. However, due to the global slowdown, the 50 percent level may not be reached, and may settle at 35 percent of the 2019 level. In effect, there may be a 15 percent drop in expected tourist arrivals with respect to BAU.</p>	<p>For 2024, a 15 percent reduction in construction investments is assumed over the BAU scenario.</p>
2025 Sector		
Export growth	Tourist arrivals and tourism revenue	Construction sector*
<p>For 2025, export growth is expected to converge to the BAU growth.</p>	<p>For 2025, it is expected that tourist arrivals may reach 60 percent of the 2019 level, according to the base simulation.</p>	<p>For 2025, a 5 percent reduction in construction investments is assumed over the BAU scenario.</p>

Sources: International Monetary Fund, “World Economic Outlook: War Sets Back the Global Recovery”, (April 2022); World Bank, “Global Economic Prospects, A World Bank Group Flagship Report”, (June 2022); OECD, “The Price of War, OECD Economic Outlook”, (June 2022); United Nations Resident Coordinator Office, “Analytical Note on The Potential Impact of the Russia-Ukraine War on the Cambodian Economy”, (May 2022).

2.3. Simulation Design

To assess the impact of the shocks through the above identified channels on the Cambodian economy, four sets of simulations were carried out:

Business-as-usual (BAU): Business-as-usual scenarios are generated based on the assumption that there are no demand shocks, or price shocks (i.e., no effect of the war in Ukraine), and that

the economy is poised to attain GDP growth rates of 5.4 percent in 2022 to 7.3 percent in 2025, similar to what was projected in the Ministry of Economy and Finance (MEF) macroeconomic framework, at the beginning of the year.

Shock and intervention scenarios: Three sets of scenarios were designed for shocks and interventions:

- **Simulation 1 – Commodity price shock:** This scenario contains the commodity price increase of three major commodities – food, oil, and fertilizer – according to the data provided in Table 1 above.
- **Simulation 2 – Commodity price shock and demand shock:** This scenario extends the commodity price increases by incorporating the demand shocks on three fronts – Cambodian exports, tourist arrivals and construction sector investments – according to the data provided in Table 2 above.
- **Simulation 3 – Government intervention:** This scenario extends the Simulation 2 with the introduction of the government socio-economic intervention packages into the model for 2022 and 2023 only, given the data availability for those two years. The interventions are detailed below.

Table 3: Government simulation packages

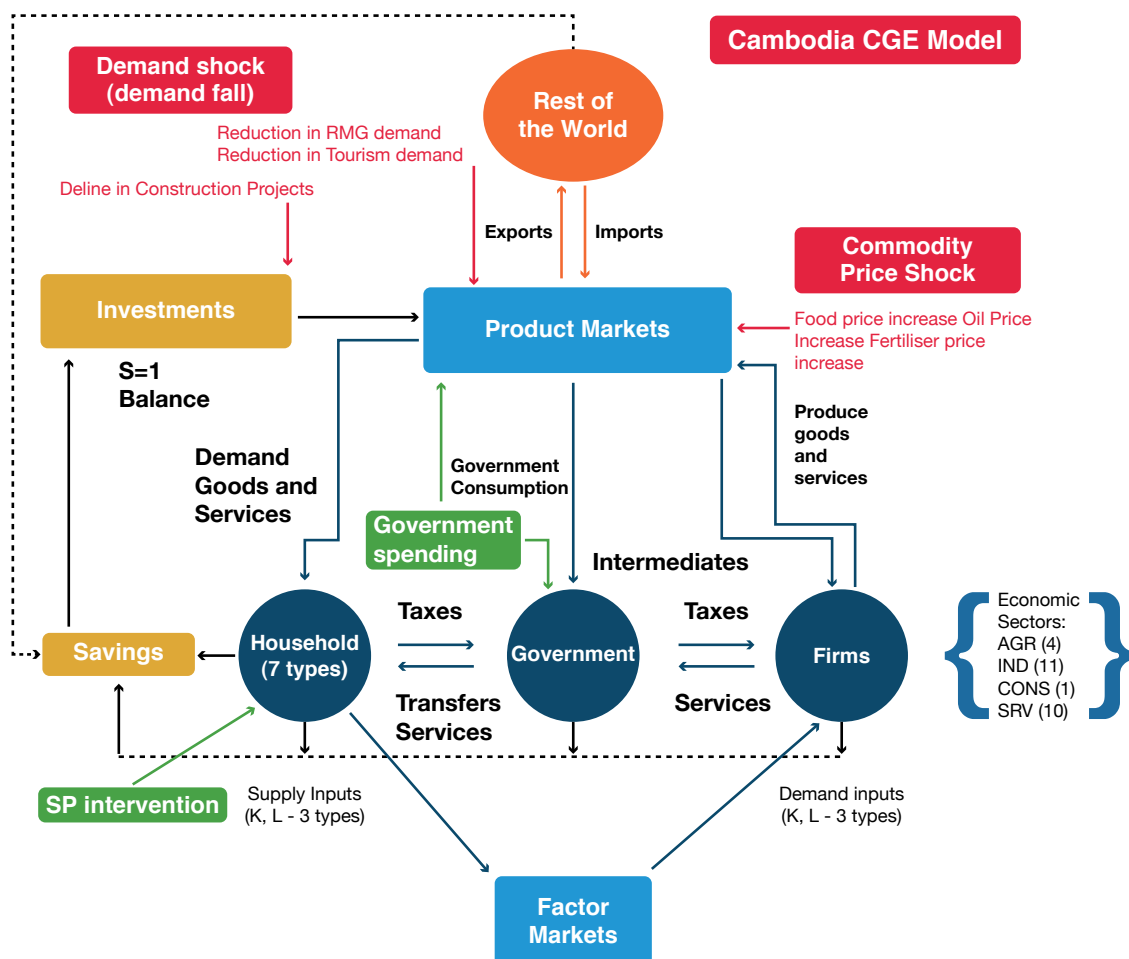
Interventions – Plans	2022 (Million US\$)	2023 (Million US\$)	Simulation Design
Public health and social intervention			
- Implementation of Health Master Plan - Outbreak prevention and treatment	100*	100	Through the health sector
Wage subsidy and skills training	59	60	Through the education sector
Cash-for-work	100	100	By providing cash for work and cash transfer to landless household (30%), small farm household (30%) and low-educated household (40%) both in 2022 and 2023.
Cash transfer programmes	373	465	
Economic intervention			
Implementations of Economic recovery strategy	250	280	By increasing government expenditure by \$250 million in 2022 and \$280 million in 2023.
Total Intervention Package (Million \$)	882	1,005	

Note: *Although \$300 million has been marked, it is argued that only \$100 million will be used for health purposes and the remaining \$200 million is likely to be allocated for cash transfers and covering budget deficit. Thus, although the size of the overall stimulus is \$1,082 million, the effective stimulus size for 2022 is reduced to \$882 million.

3. METHODOLOGY AND DATA

A Dynamic Computable General Equilibrium (DCGE) model was used to assess and simulate the impacts of price and demand shocks, as well as policy interventions, over the 2022 to 2025 period. The DCGE model includes accumulation effects and thereby allows for the study to incorporate the transition path of an economy where short-run policy impacts are likely to be different from those of the long-run. The specifications of the Cambodia Computable General Equilibrium (CGE) model are provided in Figure 1.

Figure 1: Delineation of the Cambodia CGE model with shock and stimulus locations



Note: Dark red boxes on top denote active shocks to the model.

Source: Author's representation.

The Cambodia DCGE model is calibrated by the Social Accounting Matrix (SAM) 2020, which is an updated version of the SAM 2014 ⁶, which was developed to assess the impacts of public investment on the cassava sector in Cambodia. The Cambodia SAM identifies economic relations through four types of accounts: (i) production activity and commodity accounts for

6. United Nations Development Programme, "A Social Accounting for Cambodia, 2014 Methodology and Results", (2019).

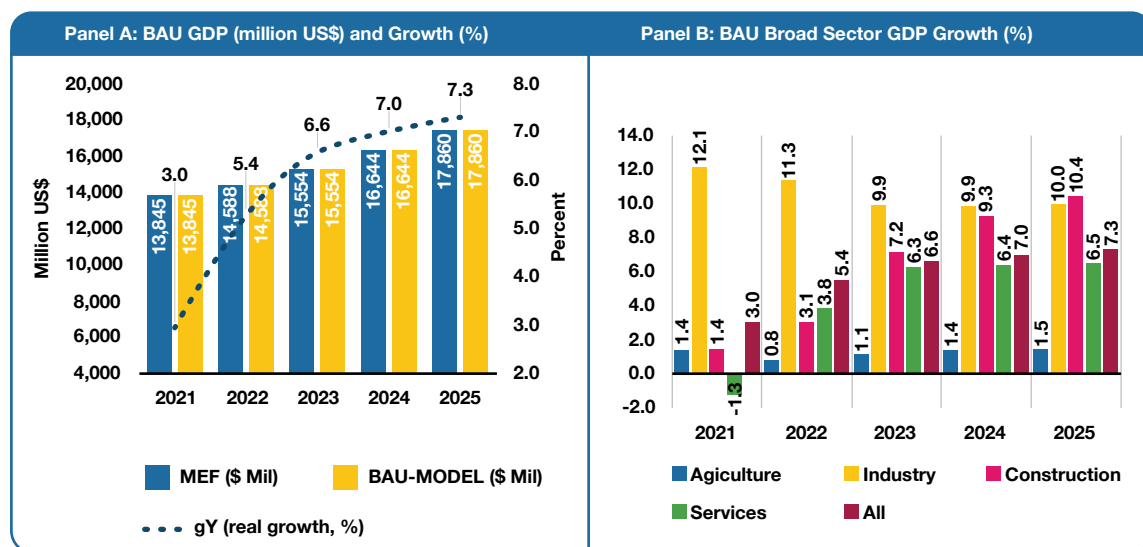
26 sectors; (ii) four factors of production with three different types of labour and one type of capital; (iii) current account transactions among the four main institutional agents; household members and unincorporated capital, corporation, government and the rest of the world; and (iv) two consolidated capital accounts distinguished by public and private origins to capture the flows of savings and investment.

4. SIMULATION OUTCOMES

4.1. BAU Scenarios (2021-2025)

Using the DCGE model, the BAU scenarios for the period 2021-2025 were generated using economic data for 2021 to 2025 from the MEF macroeconomic framework prepared in June 2022. As mentioned, an important feature is that the GDP estimated under the BAU scenarios excludes the impacts of the war in Ukraine and closely matches the GDP projected in the macroeconomic framework of MEF. Decomposition of sectoral GDP growth rates shows double digit growth rates for the industry sector for most of the reference period 2021-2025. The services sector growth in 2021 remains negative – dominated by the large negative growth of the hotel and restaurant sub-sector.

Figure 2: Ministry of Economy and Finance GDP and BAU GDP (2021-2025)



Source: Cambodia DCGE model

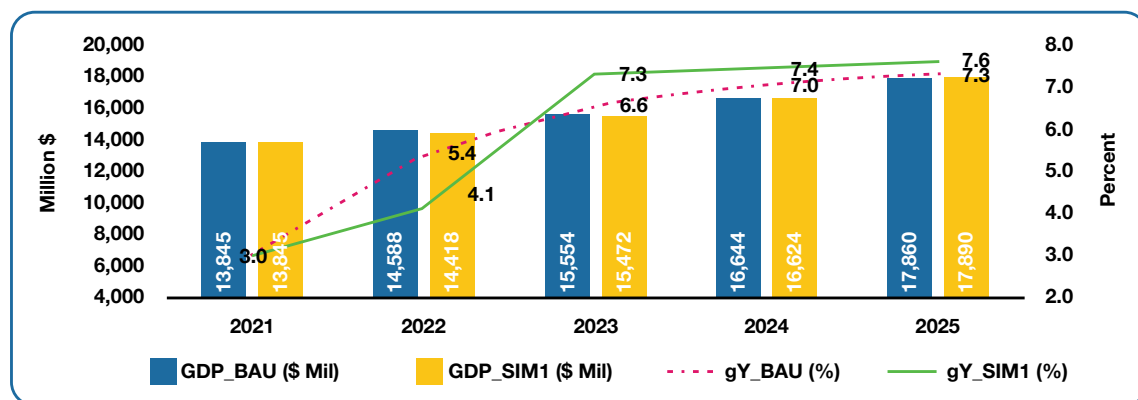
4.2. Shock Scenarios: Impact on GDP and Sectoral Economic Growth

This section presents key findings on the impact of *Simulation 1: Commodity price shock* and *Simulation 2: Commodity price shock and demand shock* on GDP and sectoral economic outputs.

- All other things being equal, the commodity price increase of the scales discussed in Simulation 1 of Table 1 is likely to reduce economic output significantly. The overall GDP growth rate may decelerate to **4.1 percent in 2022** compared to the BAU growth rate of 5.4 percent. The result seems to indicate that the commodity price shock may cause **an economic loss of approximately 1.3 percentage points of GDP in 2022**.

- Although the real GDP in 2023 under the shock scenario would be smaller than the real GDP under the BAU scenario, due to the reduced GDP base in 2022, the real GDP growth rate is likely to be 7.3 percent. That is somewhat higher than the BAU real GDP growth rate of 6.6 percent, reflecting the base effect in which a small-sized economy tends to grow at a fast pace. Thereafter, the GDP growth rates of 7.4 percent in 2024 and 7.6 percent in 2025 remain close to the BAU GDP growth rates of 7.0 percent in 2024 and 7.3 percent in 2025.

Figure 3: Simulated GDP impacts under the commodity price shock scenario (Simulation 1)

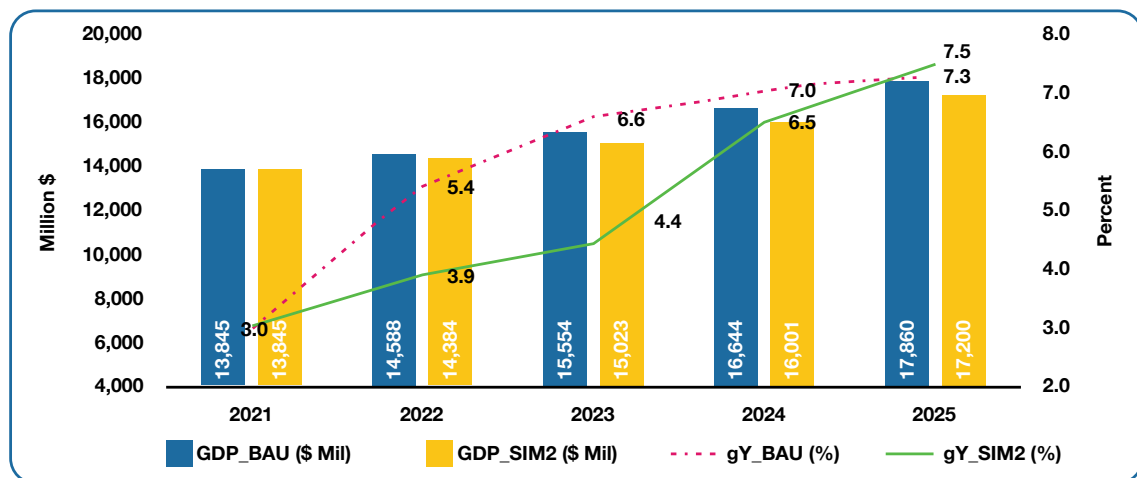


Source: Cambodia DCGE model

Simulation 2 extends Simulation 1 with demand (or income) shocks. It is thus expected that the impact on GDP and sectoral economic output should be higher under this scenario compared to Simulation 1.

- All other things being equal, the combination of a demand shock and commodity price increase shock discussed in Tables 1 and 2 is anticipated to result in the contraction of the economy even further. The GDP growth rate may decline to **3.9 percent in 2022** compared to the BAU growth rate of 5.4 percent and 4.1 percent under Simulation 1. The simulation indicates that the combined demand and commodity price increase shocks may cause **an economic loss of approximately 1.5 percentage points of GDP in 2022**.
- Due to combined demand and price shocks, GDP growth rates are likely to remain lower than the GDP growth rates projected under the BAU scenario in 2023 and 2024, but they will converge in 2025. More specifically, the GDP growth rate may decline to 4.4 percent in 2023 and 6.6 percent in 2024 compared to the BAU growth rate of 6.6 percent in 2023 and 7 percent in 2024, respectively before converging in 2025.

Figure 4: Simulated GDP impacts under the commodity price plus demand shock scenario (Simulation 2)



Source: Cambodia DCGE model

- The decomposition of sectoral GDP growth reveals that under both scenarios the impact of the combined demand and price shocks are more pronounced in 2022 and 2023 compared to 2024 and 2025. As expected, an increase in commodity prices such as fertiliser and fuel prices may have a detrimental impact on agricultural activities such as crop production on the short terms. This effect is re-enforced by the impact of the demand shock, resulting in economic contraction and income loss that would cause a decline in demand for other agricultural outputs such as livestock and fisheries. As a result, the agricultural sector is likely to have negative growth rates of 1.4 percent and 0.9 percent in 2022 and 2023, respectively.
- The construction sector growth rate may be negative in 2022 under Simulation 2 due to a decline in demand for construction projects, which is derived mainly from lower investments and income. The real estate sector, which is closely associated with construction activities, may record negative growth – especially in 2022.
- The growth rates of the broad sectors improve substantially in both 2024 and 2025 given the diminished extent of price and demand shocks in these years.

Table 4: Broad sectoral GDP growth rates under various scenarios (%)

BAU	Agriculture	Crop	Other Agriculture	Industry*	Construction	Services	Hotel	Real estate	ALL
2021	1.4	2.6	-0.8	12.1	1.4	-1.3	-39.5	0.5	3.0
2022	0.8	1.4	-0.2	11.3	3.1	3.8	16.5	2.5	5.4
2023	1.1	1.6	0.5	9.9	7.2	6.3	23.4	5.2	6.6
2024	1.4	1.8	0.8	9.9	9.3	6.4	18.4	6.3	7.0
2025	1.5	1.8	1.0	10.0	10.4	6.5	17.0	6.5	7.3

SIM 1	Agriculture	Crop	Other Agriculture	Industry*	Construction	Services	Hotel	Real estate	ALL
2021	1.4	2.9	-0.5	12.1	1.4	-1.3	-39.4	0.5	3.0
2022	-1.2	-0.4	-2.2	11.8	2.1	1.7	14.1	-0.3	4.1
2023	2.3	2.6	1.8	10.1	6.8	7.4	24.8	6.9	7.3
2024	2.1	2.5	1.6	9.7	10.0	7.1	19.3	7.3	7.4
2025	1.9	2.3	1.4	9.6	11.7	7.0	17.3	7.2	7.6
SIM 2	Agriculture	Crop	Other Agriculture	Industry*	Construction	Services	Hotel	Real estate	ALL
2021	1.4	2.9	-0.5	12.1	1.4	-1.3	-39.4	0.8	3.0
2022	-1.4	-0.6	-2.5	10.9	-0.3	2.4	12.9	-0.6	3.9
2023	-0.9	-0.4	-1.5	5.7	5.1	5.5	23.6	3.1	4.4
2024	1.2	1.5	0.6	8.7	9.1	6.3	18.4	6.2	6.5
2025	1.7	2.1	1.4	9.9	11.3	6.6	16.0	7.2	7.5

Note: *Although it is customary to include the manufacturing, mining, utilities and construction sectors to define broad sector 'Industry', here construction is shown separately thus, 'Industry' includes manufacturing, mining and utilities.

Source: DCGE model

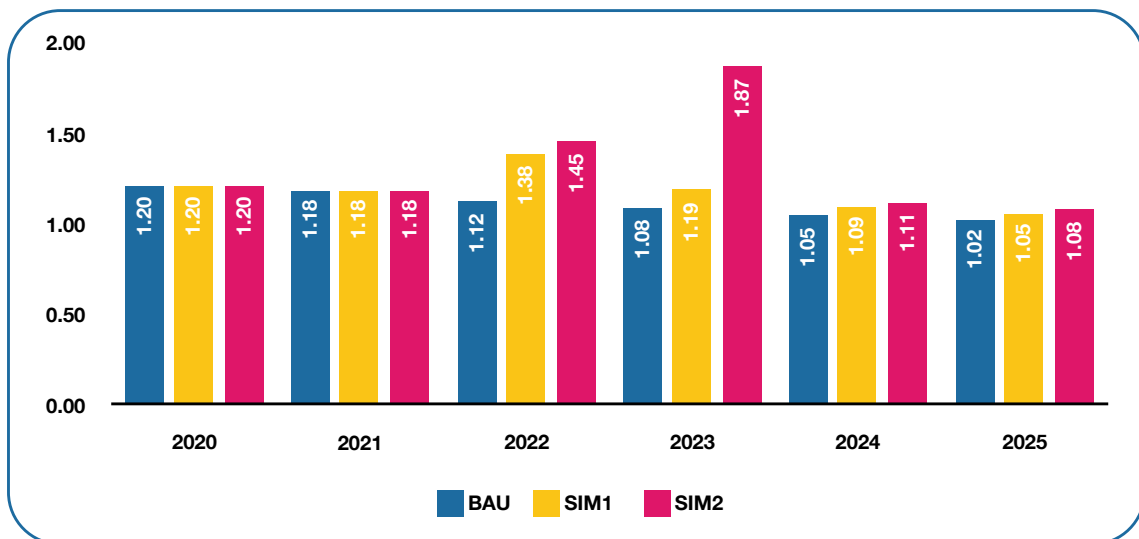
4.3. Shock Scenarios: Impact on Employment

Unemployment rates have historically been low in Cambodia, at around 2.7 to 3 percent according to Cambodia Socio-Economic Survey (CSES) from 2017 to 2019/2020. However, according to the Labour Force Survey (LFS) in 2019, the unemployment rate dropped further to 1.2 percent.⁷ Since the economy is operating almost at full employment, the impact of the current shocks on employment may not be significant.

Due to the contraction of the economy, unemployment rate may increase – especially in 2022 and 2023. Unemployment rates may increase to 1.4 percent and 1.5 percent in 2022 under Simulations 1 and 2, respectively, compared to the BAU unemployment rate of 1.1 percent. In 2023, unemployment rate may increase further to 1.9 percent compared to the BAU unemployment rate of 1.1 percent. The employment situation improves in 2024 and 2025 under both Simulations 1 and 2 compared to 2022 and 2023 due to better performance of the economy.

7. National Institute of Statistics (NIS), ILO and ADB (2021) "Report on the Cambodia Labour Force Survey 2019", Phnom Penh: Ministry of Planning.

Figure 5: Unemployment rate under the BAU and shock scenarios (%)



Source: DCGE and employment matrix (2019)

Sectoral output changes are linked to the employment matrix (based on the LFS 2019) to assess employment implications by gender. It is found that under Simulation 1, the employment impacts are higher for male workers compared to women workers for the whole study period from 2022-2025. However, the effects change under Simulation 2. Due to detrimental impacts on the textile and tourism sectors which are more women-labour intensive, the employment impacts were found to be higher for women workers under this simulation.

Table 5: Employment effects by gender (% change from the BAU employment of respective years)⁸

	SIM 1 (Price Shock)		SIM 2 (Price + Demand Shock)	
	Men	Women	Men	Women
2022	-0.491	-0.321	-0.784	-0.803
2023	-0.525	-0.425	-0.735	-0.812
2024	-0.162	-0.110	-0.234	-0.288
2025	-0.135	-0.125	-0.145	-0.240

Source: DCGE and employment matrix (2019)

4.4. Shock Scenarios: Impact on Monetary Poverty

In 2020, the estimated headcount poverty rate (i.e., poor persons as a percentage of the total population) was 17.8 percent according to official estimation by the Ministry of Planning (MoP).⁹ Due to the projected sustained positive GDP (income) growth over the 2021-2025 period (i.e.,

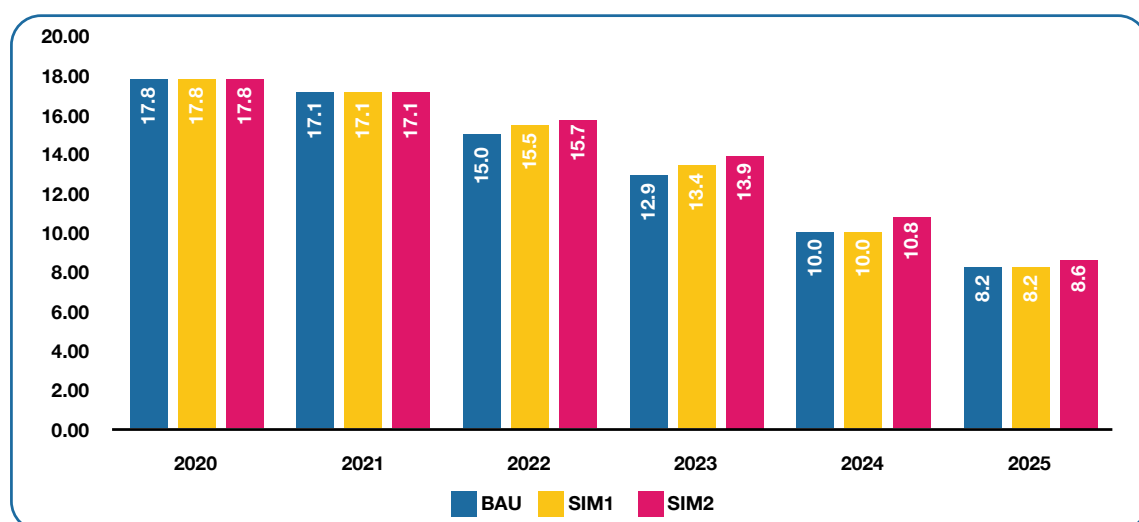
⁸ Gender is not explicitly specified in the SAM nor in the DCGE model. However, using the sectoral output change information from the CGE and LFS data of male and female employment, the percentage changes in male and female employment compared to their BAU values was calculated.

⁹ MoP (2021) "Poverty in Cambodia: Setting the New Poverty Line", Phnom Penh: Ministry of Planning.

MEF projections and the BAU growth rates), the headcount poverty rates are likely to decline steadily between 2021 and 2025. Consumption poverty rates may decline to 17.1 percent in 2021, 15.0 percent in 2022 and 8.2 percent in 2025 – implying a growth implication on poverty.

However, price and demand shocks are likely to adversely affect the poverty rate through decreased household income and consumption. The poverty rate may increase to **15.5 percent and further to 15.7 percent in 2022** under Simulations 1 and 2 respectively compared to the BAU rate of 15.0 percent. As such, the simulation reveals that the combined impact of both commodity price increases, and demand shocks (Simulation 2) is likely to cause the poverty rate to edge upwards by 0.7 percentage points compared to the BAU scenario in 2022. Poverty rates were found to decline more in 2023 compared to 2022, due to relatively better economic performance, while remaining higher than the BAU rate by 1 percentage point. Poverty rates, however, are likely to converge to the BAU poverty rates of about 8.2 percent in 2025.

Figure 6: Poverty impacts under the BAU and shock scenarios (% of population)



Source: DCGE and poverty module

4.5. Government Intervention

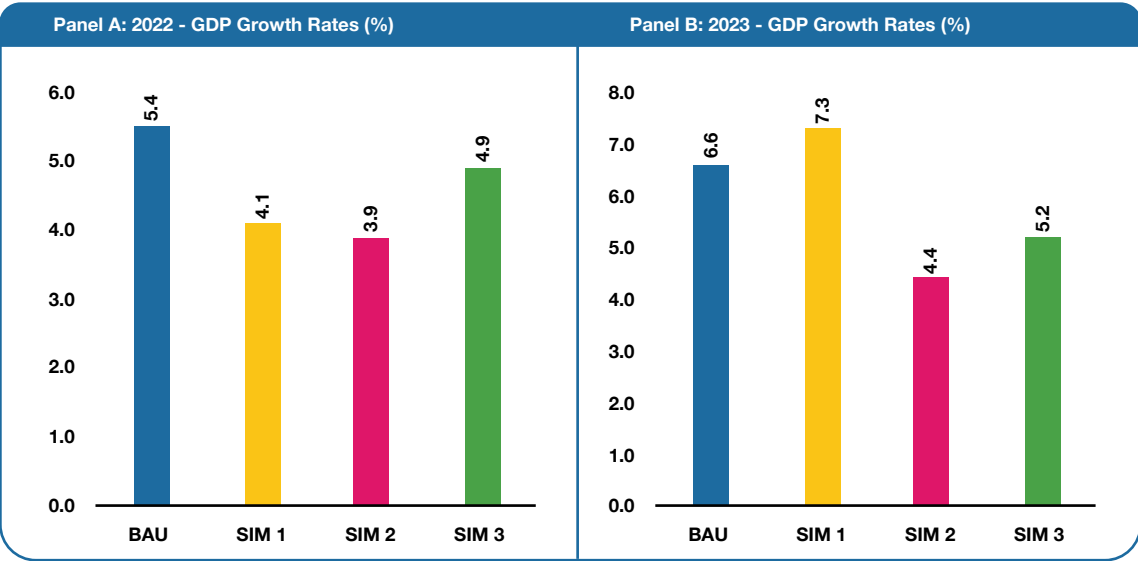
The Royal Government of Cambodia (RGC) has adopted socio-economic intervention packages equivalent to \$882 million in 2022 and \$1,005 million in 2023 to support people's lives and livelihoods and to re-simulate economic activity to recover from the pandemic. The intervention packages include health measures, wage subsidies and skills development, cash transfers and economic recovery measures – details of which are presented in Table 3. Disbursement or the implementation of the proposed interventions and reaching out to target beneficiaries in a timely manner are critical to realise the desired outcomes. Simulation 3 covers government interventions, and the key results show that:

- Interventions, if administered effectively, are likely to have salutary effects on GDP growth, employment, and poverty. GDP growth in 2022 may recover from 4.1 or 3.9 percent (under Simulations 1 and 2) to **4.9 percent**. This remains 0.5 percentage points lesser than the 5.4 percent growth rate projected in the BAU scenario. In 2023, the GDP growth rate may recover to 5.2 percent with government stimulus compared to 4.4 percent recorded under

Simulation 2. It may be relevant to note that the Asian Development Bank (ADB)¹⁰ and the World Bank (WB)¹¹ projected Cambodia GDP growth rates of 5.3 percent and 4.5 percent, respectively, for 2022.

- The positive effect of government interventions on broad sectors growth is also evident. Since a significant share of intervention packages would be channelled through social sectors and programmes (Table 3), the interventions appear to have the strongest effect on the service sector. Due to the inter-dependence between sectors, the other sectors of the economy are also affected by interventions which are more predominant in the services sectors. The second largest set of impacts are in the agriculture sector, which in addition to the inter-dependence effects, is also affected by cash transfer provided to poorer households who have higher propensity to spend on agricultural products. As presented in Table 6, the growth rate of services may increase to 4.6 percent in 2022 under Simulation 3 compared to the 2.4 percent growth rate recorded under Simulation 2. The services sector growth rate may further increase to 7.8 percent in 2023 under Simulation 3, which was estimated at 5.5 percent under Simulation 2. As a result of the interventions, the contraction of the agriculture sector growth rate in 2022 is reduced from 1.4 percent under Simulation 2 to 0.9 percent under Simulation 3. Similarly, in 2023, the agriculture sector is likely to improve with a reduction of the negative growth rate from 0.9 percent under Simulation 2 to 0.4 percent under Simulation 3. The improvement of the agriculture sector may be attributed to reduced input prices (e.g., fertiliser) and an increase in domestic demand for agricultural products such as food, which benefits from overall income recovery and an increase in household income.

Figure 7: GDP impacts under government interventions in 2022 and 2023



Source: DCGE model

10. 'Cambodia's Economy to Accelerate in 2022 and 2023 — ADB', April 06, 2022. <https://www.adb.org/news/cambodia-economy-accelerate-2022-and-2023-adb>.

11. 'Cambodia Economic Update, June 2022: Cambodia's Economy is Growing but Must Weather Oil Price Shock', June 29, 2022. <https://www.worldbank.org/en/country/cambodia/publication/cambodia-s-economy-is-growing-but-must-weather-oil-price-shock>

Table 6: Broad sector GDP growth rates under the government intervention scenario – Simulation 3 (%)

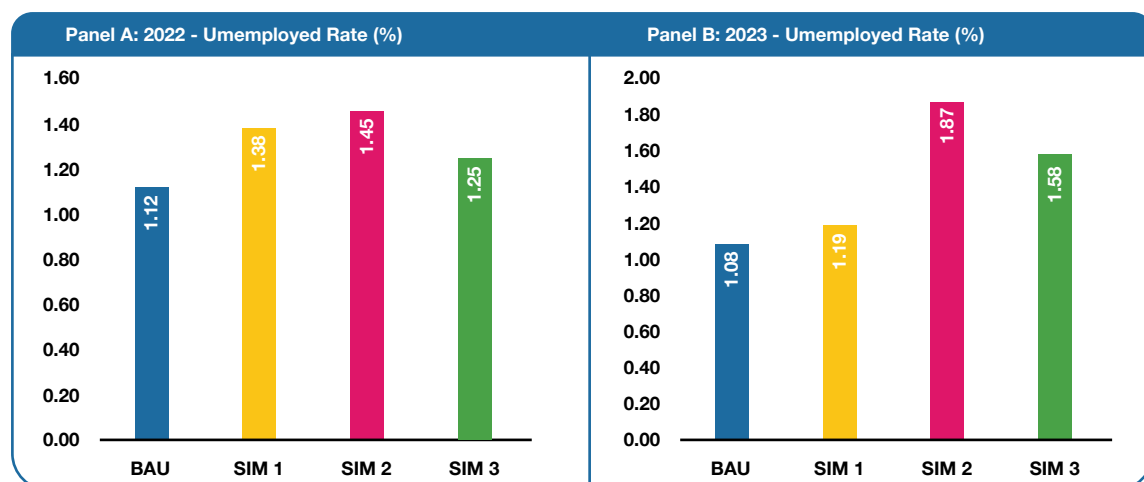
	SIM2			SIM3		
	2021	2022	2023	2021	2022	2023
Agriculture	1.4	-1.4	-0.9	1.4	-0.9	-0.4
Crop	2.9	-0.6	-0.4	2.9	-0.1	0.1
Other agriculture	-0.5	-2.5	-1.5	-0.5	-1.9	-1.0
Industry	12.1	10.9	5.7	12.1	11.1	5.1
Construction	1.4	-0.3	5.1	1.4	2.2	5.7
Services	-1.3	2.4	5.5	-1.3	4.6	7.8
Hotel	-39.4	12.9	23.6	-39.4	12.3	23.2
Real estate	0.8	-0.6	3.1	0.8	2.2	4.7
ALL	3.0	3.9	4.4	3.0	4.9	5.2

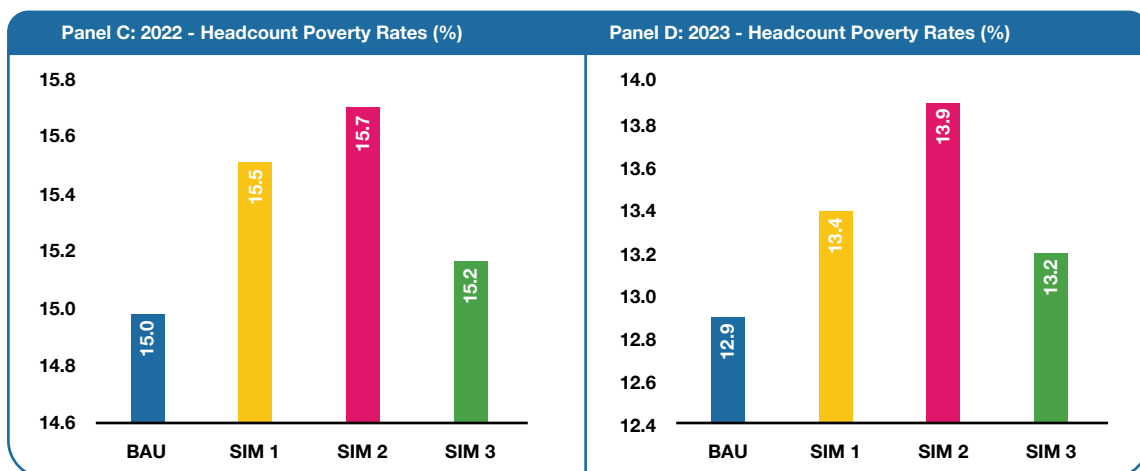
Source: DCGE model

As a result of the expansion of the economy in 2022 due to government stimulus, unemployment rate would decline from 1.5 percent under Simulation 2 to 1.3 percent under Simulation 3. In 2023, the unemployment rate could drop from 1.9 percent under Simulation 2 to 1.6 percent under Simulation 3.

Gains in GDP resulting from government interventions also have a positive effect on poverty. In 2022, the poverty rate may drop from 15.5 percent and 15.7 percent under Simulations 1 and 2 respectively to 15.2 percent under Simulation 3, which falls short by 0.2 percentage points from the BAU poverty rate of 15.0 percent. In 2023, the monetary poverty rate may decline from 13.4 percent under Simulation 1 and 13.9 percent under Simulation 2 to 13.4 percent under Simulation 3.

Figure 8: Employment and poverty impacts under government interventions in 2022 and 2023





Source: DCGE, employment and poverty module

5. CONCLUDING OBSERVATIONS AND RECOMMENDATIONS

Although Cambodia is recovering from the pandemic, the country faces additional uncertainties driven largely by external shocks. Using a well-accepted methodology and the latest country data (as available), this brief assesses the economic and social impacts of prolonged COVID-19 and of the war in Ukraine. The simulated impacts on major indicators such as GDP and poverty are substantial in 2022 and 2023. However, the simulation outcomes confirm the importance of government support and interventions. Accordingly, the planned interventions by the Royal Government of Cambodia may have salutary impacts. These interventions will require timely and efficient implementation.

Recommendations:

Uncertainty shocks such as COVID-19 and the war in Ukraine have reversed development gains and spurred the need to strengthen the country's resilience, i.e., its capacity to absorb shocks and protect the most vulnerable. For this purpose, Cambodia may consider the following measures:

- **Double down on investments in human development, particularly education and health.** Universal health care and education should be adopted with a progressive fee structure that makes these essential services accessible and affordable to all. Countries that invested in public health and education have recovered faster from the pandemic. Investing in human capacities can boost productivity, which will in turn drive sustained economic growth.
- **Further strengthen the social protection system.** The surge of social protection in Cambodia in the wake of the COVID-19 pandemic, such as the *COVID-19 Cash Transfer Programme for Poor and Vulnerable Households*, has been effective. Further investing in, for example, targeted basic income and social protection for the poorest and most vulnerable people, with particular attention to women, will help reduce inequalities and enhance resilience. This will also support gradual movement towards universal access to social protection.

- UNDP has been piloting with the General Secretariat for the National Social Protection Council and the Ministry of Social Affairs, Veterans and Youth Rehabilitation an asset-based social protection, also known as graduation social protection, with productive pathways such as provision of agricultural inputs, technical training, financial literacy and income generation opportunities. Social and Behavioural Change Communications could encourage positive behaviours, such as promoting good nutrition and healthy diets.
- **Foster an ecosystem for inclusive innovation.** This may include innovation on many fronts from the production of goods and services to community development – technological, economic, and social innovation – to enable the country to increase its competitiveness and to leapfrog on its development path.
- **Increase the share of domestic energy resources and its diversification.** Increased dependence on energy imports is leading to a sharp increase in inflation, therefore affecting the GDP. Energy transition towards maximising the use of renewable resources such as solar energy, modal shifts such as electric mobility and energy efficiency will boost economic competitiveness, create new jobs domestically, and promote green credentials of the country.
- **Promote Site-Specific Nutrient Management (SSNM).** The SSNM will increase fertilizer use efficiency, reduce greenhouse gas emission (GHG) while maintaining or enhancing crop yields. The SSNM will help farmers reduce costs of production amidst the fertilizer price increase. The adoption of SSNM at scale requires government investment to generate soil properties, conduct on-farm nutrient trials and soil tests, develop capacity to monitor crops' nutrient status, decision support systems and farmer-friendly tools and techniques accessible to farmers and farm advisors: right products, right rate, right time and right place.
- **Scale up agroecology and nature-based solutions.** The growing pressure on natural resources such as on soils, water and biodiversity and climate risks require a shift from high-external inputs and resource intensive production systems towards agroecology to optimise mutually beneficial interactions between plants, animals, humans, and the environment. Fostering local organic fertilizer production and trading such as composts will contribute to scaling up agroecology.

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