DEPARTMENT OF
ECONOMIC AND
SOCIAL AFFAIRS

Consolidated Report of the DESA project, "Establishing crisis response process in the LDC monitoring framework for graduating and graduated countries"

3 December 2021

This report was prepared under the capacity development activities of the Development Policy Branch (DPB), Economic Analysis and Policy Division (EAPD), United Nations Department of Economic and Social Affairs (DESA). The Project is funded by the Regular Progamme of Technical Cooperation. Inputs from the project consultants, Trudi Harzenberg, Arshia Karki, Keith Nurse, Latsany Phakdisoth, Mohammad Masudur Rahman, Miliana Ratu, and Tandin Wangchuk, are gratefully acknowledged. Comments from Debapriya Bhattacharya, Matthias Bruckner, and Rolland Mollerus were very helpful.
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Introduction

The UN Committee for Development Policy (CDP) examines the development progress of the graduating and graduated countries and report to ECOSOC in case it finds any signs of regression of those countries with a risk to fall back to the LDC category. The importance of monitoring will acquire new magnitude as 16 countries are currently progressing towards graduation. These graduating countries are characterized by, among others, macroeconomic imbalances, geographical handicaps, fragility and conflicts, and climate emergency. The developmental circumstances of these countries may also come under pressure due to the loss of international support measures, particularly in the area of trade and finance. The current COVID-19 pandemic is also going to have far-reaching detrimental impact on these countries, putting their achievements at risk.

To assist graduating and graduated countries to build resilience, the Economic Analysis and Policy Division (EAPD) aims to explore a process to establish a crisis response mechanism that can be used by the CDP in situations when graduating or graduated countries are subject to a variety of crises and emergencies that can undermine their economic and social development efforts. EAPD develops country-specific crisis response process in which particular crisis indicators to monitor constantly and to establish thresholds that may trigger specific types of actions and support in the case of a severe economic, environmental, or health crisis caused by exogenous shocks that affect a graduating or graduated country.

Building crisis response process within the enhanced monitoring mechanism will contribute to preparing and implementing national development strategies of LDCs, particularly the component on smooth transition strategies. As CDP recommended in its annual report to ECOSOC, it is critically important to integrate the smooth transition strategy with their own national development plans. In this context, the project is funded by the Regular Programme of Technical Cooperation by UN DESA. The activities of the present project are a response to the mandate by the ECOSOC resolution on CDP report in 2021 (E/RES/2021/11), paragraph 2, "[ECOSOC] Notes the work carried out by the Committee on... (e) an enhanced monitoring and mechanism and graduation process...", and paragraph 6, "[ECOSOC] Notes that the Committee will pay special attention to the impacts of the pandemic on achieving Agenda 2030 when monitoring graduating and recently graduated countries in the coming years, and in this context calls upon Member States and relevant UN entities to support the Committee's efforts to enhance the existing monitoring mechanism.

This consolidated report presents a summary of the suggested indicators to monitoring the potential crisis for 10 countries in the pipeline, namely, Angola, Bangladesh, Bhutan, Kiribati, Lao PDR, Nepal, Sao Tome and Principe, Solomon Islands, Tuvalu and Vanuatu. Details on the suggested indictors, data sources, justification of the use of the indicators, as well as setting the threshold values are elaborated in the national reports in the Annexes.

Angola

Suggested indicators to monitor potential crisis are listed table 1. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 1.

Table 1 Potential Indicators for Crisis Monitoring for Angola

Category	In. No.	Indicator	Frequency used	Measurement	Source	Threshold
Economic	1	Oil price	Monthly	USD	IMF	30% drop of 3 month avg
	2	Exchange rate	Monthly	Currency/USD	IMF	10% drop
Disasters	3	Flood			EMDAT	20,000 affected
Health	4	Pharmaceutical imports	Monthly	USD	ITC	33% increase

Bangladesh

Some of the suggested indicators to monitor potential crisis are listed table 2. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 2. Indicators that are available yearly or with difficulties in setting the thresholds have been excluded.

Table 2 Potential Indicators for Crisis Monitoring for Bangladesh

Category	In. No.	Indicator	Frequency used	Measurement	Source	Threshold
Economic	1	Government revenue	Quarterly	% of GDP	Economic Review (various issues), Ministry of Finance	≤ 3% of GDP
	2	Government Expenditure	Quarterly	% of GDP	Economic Review, Ministry of Finance	≥4% of GDP
	3	Current account balance	Quarterly	% of GDP	Quarterly Economic Trend, Bangladesh Bank (BB)	≤0
	4	Inflation	Monthly	Percentage point change	Bangladesh Bank	≥6%
	5	Remittance	Monthly	US$ Million	Monthly Economic Trend, BB	≤ 2 billion per month
	6	Overseas Employment	Monthly	Number of persons per month	Bureau of Manpower, employment and Training (BMET)	≤ 50000 per month
	7	Export	Monthly	US$ Million	EPB, Bangladesh Bank	≤ 3.5billion per month
	8	Foreign Reserve	Monthly	US$ Million	Bangladesh Bank	≤30 bill or ≥ 6months import capacity

	9	Rice Price	Quarterly	US$/ MT	Bangladesh Bank	≥10 % increase
	10	Cotton Price	Weekly	US$/lb	Macrotrends	≥5 % increase
Health	11	Weekly Trend of Covid Case	Weekly	Total number of positive cases	Director General of Health Service, GOB	≥1000 confirmed cases per week
Disasters	12	Flood/Cyclone /Strom (Natural)		Number of people affected	Compilation from EM-DAT, CRED/UCLouvain	≥ 100000
	13	Ferry accident/fire in the factories/ Human induced		Number accidents	EM-DAT, CRED/UCLouvain, Brussels	≤ 5
	14	New diseases		Number of new diseases	EM-DAT, CRED/UCLouvain, Brussels	New disease outbreak
	15	Air quality		AQI or PM 2.5 concentration	IQAir	AQI >100 or PM2.5 >35.4 µg/m³

Bhutan

Some of the suggested indicators to monitor potential crisis are listed table 3. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 3. Indicators that are available yearly or with difficulties in setting the thresholds have been excluded.

Table 3 Potential Indicators for Crisis Monitoring for Bhutan

Category	**In. No.**	**Indicator**	**Frequency used**	**Measurement**	**Source**	**Threshold**
Economic	1	Headline Inflation in India	Monthly	Percentage	Ministry of Statistics and Programme Implementation (MOSPI) of India	4% (+/-2)
	2	Number of Tourist arrival	Quarterly	Number	TCB	At least 100,000
	3	Non-performing	Quarterly	Percentage	RMA	5%

		loans to total gross loans				
Health	4	Number of new confirmed cases of Covid-19	Weekly	Number	MoH	TBC
	5	Number of new cases at Entry Points (by air & land)	Weekly	Number	MoH	TBC
	6	Occurrence of notifiable disease or syndrome.	Weekly	Type of case	MoH	TBC
Disasters	7	Water level in the identified potentially dangerous glacial lakes (m) and EWS stations	Weekly	Meters	National center for Hydrology and Meteorology (NCHM)	TBC based on local avg

Kiribati

Some of the suggested indicators to monitor potential crisis are listed table 4. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 4.

Table 4 Potential Indicators for Crisis Monitoring for Kiribati

Category	**In. No.**	**Indicator**	**Frequency**	**Measurement**	**Source**	**Threshold**
Economic	1	Commodity prices	Monthly	$/ unit	Pacific Data Hub/ World Bank Commodity Prices	
	2	Number of Visitor Arrivals	Monthly	Monthly growth rate	Tourism Development Department, Ministry of Informati	< zero monthly growth rate.

Category	In. No.	Indicator	Frequency	Measurement	Source	Threshold
					on Culture and Tourism	
	3	Consumer Price Index (Inflation)	Monthly	% change over same period last year	Pacific Data Hub	
	4	International Merchandise Trade Statistics (IMTS)	Monthly	Amount Trade balance	Pacific Data Hub	
Disasters	6	Sea level rise	monthly	Percentage Meters rise	http://www.bom.gov.au/ntc/IDO70056/IDO70056SLD.shtml#stats	
	7	Sea surface temperature	monthly	Percentage change Degrees Celsius	http://www.bom.gov.au/ntc/IDO70060/IDO70060SLD.shtml	
Health	8	COVID-19 status	daily	presence	Pacific Data Hub & the Pacific Community (SPC) Public Health Division	
	9	Cumulated number of cases of COVID-19	daily	units	Pacific Data Hub & the Pacific Community (SPC) Public Health Division	

Lao PDR

Some of the suggested indicators to monitor potential crisis are listed table 5. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 5. Indicators that are available yearly or with difficulties in setting the thresholds have been excluded.

Table 5 Potential Indicators for Crisis Monitoring for Lao PDR

Category	In. No.	Indicator	Frequency	Measurement	Source	Threshold
Economic	1	Inflation rate	Monthly	Percentage point change	Bank of Lao PDR	≥6%

Category	In. No.	Indicator	Frequency	Measurement	Source	Threshold
	2	Exchange rate	Daily	Kip to US dollar	Bank of Lao PDR	±5% monthly YOY fluctuation
	3	Gap between Commercial Bank and Parallel market Rate	Monthly	Gap in Percentage	Bank of Lao PDR	≥5% monthly gap
	4	Foreign reserves	Monthly	US$ Million	Bank of Lao PDR	<US$1,300 mil.
	5	Credit growth rate	Monthly	Percentage	Bank of Lao PDR	≤ zero monthly growth rate (YoY)
	6	Non-performing loans to total gross loans ratio	Quarterly	Ratio	Bank of Lao PDR	≥5%
	7	Number of Tourist Arrivals	Monthly	Monthly growth rate	Tourism Development Department, Ministry of Information Culture and Tourism	≤ -30% monthly growth rate.
Disasters	8	Number of people killed and affected by a natural disaster	Ad hoc	Number of People affected	EM-DAT, CRED	> 40,000 ppl affected
	9	Number of Earthquakes	Ad hoc	Number of earthquakes	Lao National Earthquake Data Information Center	>10 time per month and / or when a 5.5 Richter strikes the country
Health	10	Air quality	Daily	AQI or PM 2.5 concentration	IQAir	AQI >100 or PM2.5 >35.4 µg/m³
	11	Number of confirmed COVID-19 cases	Daily	Number of confirmed cases	Lao COVID-19 Task Force	>1,000 confirmed cases per day
	12	Number of deaths from road accidents	Monthly	Number of deaths	Traffic Police Department, Ministry of	>100 deaths per month

Category	In. No.	Indicator	Frequency	Measurement	Source	Threshold
					Public Security	
	13	Air traffic to Wattay International Airport	Daily	Percentage	Flightradar24	Percentage of tracked flights to scheduled flights is below 10%

Nepal

Some of the suggested indicators to monitor potential crisis are listed table 6. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 6. Indicators that are available yearly or with difficulties in setting the thresholds have been excluded.

Table 6 Potential Indicators for Crisis Monitoring for Nepal

Category	In. No.	Indicator	Frequency used	Measurement	Source	Threshold
Economic	1	Net Liquidity	Monthly	Percent	NRB[1], BFS	Minimum required 20%
	2	Core Capital Adequacy Ratio (CCAR)	Monthly	Millions of Rupees	NRB, BFS	Minimum required by NRB regulation is 6%
	3	Capital Adequacy Ratio (CAR)	Monthly	Millions of Rupees	NRB, BFS	Minimum required by NRB regulation is 10%
	4	Non-performing Loan to Total Loan	Monthly	Percent	NRB, BFS	5% international standard
	5	Workers' Remittances	Monthly	Millions of Rupees	NRB	100,000 (Millions of Rupees)
Disasters	6	National Wholesale Price Index (Agricultural commodities)	Quarterly	Index	NRB, EB[2]	250 (average)

[1] NRB, BFS: Nepal Rastra (Central) Bank, Bank and Financial Statistics monthly report

[2] NRB, EB: Nepal Rastra (Central) Bank, Economic Bulletin quarterly report

	7	Earthquake	Real time	Richter scale	ESN[3]	6 Richter scale
	8	Floods and landslides		Total death/ affected	EM-DAT	>50,000 affected
Health	9	Number of confirmed COVID-19 cases	Daily	Number of cases	ourworldindata.org	>1,000 confirmed cases per day

Sao Tome and Principe

Some of the suggested indicators to monitor potential crisis are listed table 7. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 1.

Table 7 Potential Indicators for Crisis Monitoring for Sao Tome and Principe

Category	In. No.	Indicator	Frequency used	Measurement	Source	Threshold
Economic	1	Cocoa price	Monthly	USD	IMF	20% drop of 3 months avg
	2	Travel service export	Quarterly	USD	ITC	30% drop
	3	Exchange rate	Monthly	Currency/USD	IMF	7% drop
Disasters	4	Flood			EMDAT	10,000 affected
Health	5	Pharmaceutical imports	Monthly	USD	ITC	33% increase

Solomon Islands

Some of the suggested indicators to monitor potential crisis are listed table 8. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 7.

Table 8 Potential Indicators for Crisis Monitoring for Solomon Islands

Category	In. No.	Indicator	Frequency used	Measurement	Source	Threshold
Economic	1	Imports	Monthly	SBD millions	CBSI	30% below the past 2 year average
	2	Domestic Production Index	Monthly	Weighted Index	CBSI	30% below the past 2 year average
	3	Foreign Reserves		SBD million	CBSI	

[3] ESN: Environment5al Statistics of Nepal, 2019

Disasters	4	Buildings Damaged		No. of buildings damaged	NDMO CBSI	Where buildings damaged exceed the average
Health	5	Covid confirmed cases	Daily	Number of individuals	WHO https://covid19.who.int/table	
	6	New Covid deaths	Daily	Number of deaths	WHO https://covid19.who.int/table	

Tuvalu

Some of the suggested indicators to monitor potential crisis are listed table 9. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 4. Indicators that are available yearly or with difficulties in setting the thresholds have been excluded.

Table 9 Potential Indicators for Crisis Monitoring for Tuvalu

Category	**In. No.**	**Indicator**	**Frequency**	**Measurement**	**Source**	**Threshold**
Economic	1	Commodity prices	Monthly	$/ unit	Pacific Data Hub/ World Bank Commodity Prices	
	2	Number of Visitor Arrivals	Monthly	Monthly growth rate	Tourism Development Department, Ministry of Information Culture and Tourism	< zero monthly growth rate.
	3	Consumer Price Index (Inflation)	Monthly	% change over same period last year	Pacific Data Hub	
	4	International Merchandise Trade Statistics (IMTS)	Monthly	Amount Trade balance	Pacific Data Hub	
Disasters	6	Sea level rise	monthly	Percentage Meters rise	http://www.bom.gov.au/ntc/I	

Category	In. No.	Indicator	Frequency	Measurement	Source	Threshold
					DO70056 /IDO70056SLD.shtml#stats	
	7	Sea surface temperature	monthly	Percentage change Degrees Celsius	http://www.bom.gov.au/ntc/IDO70056/IDO70056SLD.shtml#stats	
Health	8	COVID-19 status	daily	presence	Pacific Data Hub & the Pacific Community (SPC) Public Health Division	
	9	Cumulated number of cases of COVID-19	daily	units	Pacific Data Hub & the Pacific Community (SPC) Public Health Division	

Vanuatu

Some of the suggested indicators to monitor potential crisis are listed table 10. Detailed data sources, and justification of the use of the indicators and the threshold values are described in the national report in Annex 7.

Table 10 Potential Indicators for Crisis Monitoring for Vanuatu

Category	In. No.	Indicator	Frequency used	Measurement	Source	Threshold
Economic						

Moving forward

The CDP will discuss at the expert group meeting in January 2022 and the plenary in February 2022, to validate the crisis monitoring indicators and discuss how to operate the crisis response process. Issues to be decided can be as follows:

1. Is there a need for some harmonization, while keeping the indicators country-specific. Some indicators may be of interest for additional countries (think of tourist arrivals in Nepal or STP). There is a risk that heterogeneity of indicators is not only caused by country-specifics, but also by expertise of independent experts.
2. In addition to discussing this in the country consultations, should there be additional discussions with the country and with UN agencies?
3. How do we operationalize the crisis indicators? The proposals righty focus a lot on national level data. But they be published only with some delay. In addition, there are many different sources,

and the CDP Secretariat does not have resources to constantly check the various sources. Therefore, alternative arrangement needs to be made:

   a. Securing funds for long time local consultancies working part time to prepare and submit the data?
   b. Having the LDC focal point in the Governments to self-monitor these indicators and keep the data updated?

4. How does the crisis response process work in practice. The current proposal of the crisis response process is as follows:
   a. The CDP considers a crisis response process within the enhanced monitoring mechanism when graduating or graduated countries are subject to crises and emergencies that can undermine their economic and social development efforts. The crisis response process can be triggered in two ways:
      i. **Request:** The Government submits a letter to the CDP, reporting a crisis situation that may include economic shocks and disasters. The situation can also include political shocks, as long as immediate and longer-term socio-economic impacts are expected (such as armed conflict). UN RC, and the CDP country rapporteur can also report to the Committee to trigger the crisis response process. Through regular meetings of the IATF on graduation, Members of the IATF may bring up crisis situations and make suggestions to the CDP.
      ii. **Data:** The Secretariat informs the CDP and the country in question when crisis monitoring indicators passes thresholds. High frequency data will be used for economic indicators, and occasional and up-to-date data will be used for the case of disasters and other types of emergencies. For countries depending on commodity exports, the trigger indicators may include oil and other commodity prices in the international markets. For macroeconomic stability, tax revenue, public debt, foreign reserve, and exchange rate could be used. On disasters, the scale and category, fatalities, people affected, or damages caused by the disaster can be used. The indicators and thresholds can be adjusted for each country by the CDP country rapporteur and the Secretariat, take into account country specific factors.
   b. Once the crisis response process is triggered either by the request or by the data, the Secretariat and the CDP country rapporteur conduct a crisis assessment evaluating possible impacts of the crisis on the country's smooth transition from the LDC category. Should the Committee confirm that immediate response needs to be taken based on the analysis, the Committee alerts and recommend further actions to ECOSOC and other stakeholders.
5. If the crisis response process is triggered by a request by Government, UN RC or CDP members, it doesn't require a consent by the country. If actions should be taken or recommended by the CDP, it may need a consent by the country.
6. Likewise, once the crisis response process is triggered by the data, the CDP conducts a crisis assessment which doesn't require a consent by the country. Based on the finding of the crisis assessment, actions can be taken of recommended by the CDP, which may require a consent by the country.
7. More details are need for the action part (b) of the crisis response process. For instance, scope and timeline of the crisis assessment, roles for the CDP members, IATF and RC, and so on.

Annex 1. Angola and Sao Tome and Principe Report

Annex 2. Bangladesh Report

Annex 3. Bhutan Report

Annex 4. Kiribati and Tuvalu Report

Annex 5. Lao PDR Report

Annex 6. Nepal Report

Annex 7. Solomon Islands and Vanuatu Report

Monitoring Angola and São Tomé & Principe's LDC Graduation Progress

19 November 2021

Introduction

Angola and São Tomé and Principe (STP) are two LDCs poised to graduate from LDC status in the no-too-distant future. Both countries have made progress over the past decade in indicators such as the reduction of child mortality and the reduction of external debt. STP has shown consistently positive GDP growth over the decade, while Angola's growth has been more volatile, and influenced strongly by the market for crude fuels.

However, both countries remain vulnerable, especially as a consequence of the impacts of the Covid-19 pandemic. Both are commodity-dependent nations, with their economic fortunes tied to global levels of economic activity and global demand. However, whereas Angola is an exporter of crude fuels, STP exports two primary agricultural products: cocoa extracts and palm oil. Their economies are undiversified and unsophisticated, and therefore more vulnerable to market-driven shocks in these sectors.

In light of this, the Economic Analysis and Policy Division (EAPD) of UN-CDP aims to establish a crisis response mechanism that can be used by the CDP in situations when graduating or graduated countries are subject to a variety of crises and emergencies that can undermine their economic and social development efforts. This initiative calls for the design of a response mechanism driven by relatively high-frequency data inputs in three primary areas:

1. Macroeconomic
2. Natural disasters
3. Health and other emergencies

Whereby the mechanism compares incoming data to assessed threshold levels, such that a rapid response may be formulated and implemented in the case of crisis in any of these three areas.

Overview

In order to address the preceding, we will proceed as follows:

1. Overview and review the status and profile of the two countries in terms of economic indicators, health indicators and natural disaster indicators.
2. Describe any particular vulnerabilities to crises in these areas.
3. Investigate whether these countries were impacted by crises in these areas in the recent past, and what the response and outcomes were.

4. Develop an early-warning system for each of the three areas. In the case of economic crises, a model will be developed using leading indicators of crises, based on historical experience, using quantitative methods.
   In the case of health, for which leading indicator indicators are not available, a model will be developed using coincident indicators. This will be done by identifying and sourcing a set of indicators that are both available and relevant to the potential for crisis. A model will be developed that proposes thresholds for each indicator beyond which an early warning is triggered. This will be justified by historical experience, evidenced by quantitative testing, in the two countries and/or by experience with comparable developing countries.
   For natural disaster indicators, it is important to recognise STP as a small island developing state, and Angola's vulnerability to both floods and droughts.
5. Propose a training programme in the devised early warning mechanism, for government officials.

Overview of the status of the two countries

Both Angola and STP's economies are heavily based on primary resources. In the case of Angola, for 2019, 94% of its export earnings came from crude oil products (HS27) while 74% of São Tomé & Principe's exports were basic cocoa products (HS18) (ITC 2021). STP is also classified as a 'small island developing state' (SIDS), where the SIDSs are a group of small countries so defined due to their geographic characteristics and small economies. As the world decarbonises and shifts away from the use of fossil fuels, Angola's reliance on crude oil increases its vulnerability. Data for 2019 on the structure of the economies also reveals this primary nature of their production (OECD 2021):

- Angola's value-added share of non-manufacturing industry is 25%, the bulk of which is extractive industry related to crude oil extraction; as compared with a middle-income developing country such as South Africa, at 10%.
- STP's value-added share of agriculture in total output is 12%, as compared with South Africa, at only 2%.

In addition, STP's economy is heavily reliant on the hospitality industry related to tourism, at 30% value-added share in output. This suggests that STP is particularly vulnerable to crises that affect international travel and tourism, such as the recent Covid-19 pandemic and its consequences. In essence, tourism services are 'exports' in that their positive impacts on the foreign exchange reserves and their multiplier effects on the local economy are similar to that for merchandise exports (UNDP 2020).

Both Angola and STP demonstrate particular vulnerabilities to natural disasters, in particular flooding (including storms and flash floods) and droughts. Associated impacts such as sea level rise, especially for STP as a SIDS is notable; and this is compounded by extreme heat.

The early warning system (EWS) for economic crises should then take into account export earnings for important exports (including services as the case may be), prices of important exports, exchange rates and output/GDP per capita.

Potential and actual data sources for the development of the early warning system are presented in Table 1 below.

Table 1: Data sources

Category	Type of data	Relevant to these countries	Accessed Source of Data	Original Data Source	Periodicity	Last update	Notes
Economic	National product and national income	Angola and STP	World Bank National Accounts data	N/A	Annual	2020	
	Aggregate disposable income	Angola and STP	N/A		Annual		
	Final consumption expenditure	Angola and STP	World Bank National Accounts data. Not available for STP	N/A	Annual	2020	
	Tourism demand and related services	STP	ITC Trade Map	N/A	Quarterly	Q4 2020	9 months out of date
	Commodity prices of major exports	Angola and STP	IMF PCS	N/A	Monthly	September 2021	Has API
	Exchange rates	Angola and STP	IMF	N/A	Monthly	September 2021 (Angola), February 2021 (STP)	STP is not up to date
	International liquidity	Angola	IMF	N/A	Monthly	September 2021	STP is not up to date
	Exports data of major exports	Angola and STP	ITC Trade Map/UN Comtrade	Partner countries	Monthly	August 2021	Mirror data
	Forecasted and projected indicators	Angola and STP	Economist Intelligence Unit	Same	Quarterly	Q3 2021	Subscription only
Health	Mortality statistics	Angola and STP	**Estimates:** UN World Population Prospects; Human Mortality Database; WHO estimates; World Bank HNP Statistics	N/A	Annual	2020	
	Hygiene statistics	Angola and STP	Washdata.org	N/A	Annual	2016	
	Sanitation statistics	Angola and STP	Washdata.org	N/A	Annual	2016	
	Infant and young child health statistics	Angola and STP	UNICEF	N/A	Annual	2020	
	Reported cases of specific diseases	Angola and STP	WHO	N/A	Annual	Varies, very few more recent than 2020	
	Imports of health related products	Angola and STP	ITC Trade Map/UN Comtrade	Partner countries	Monthly	August 2021	Mirror data

Category	Type of data	Relevant to these countries	Accessed Source of Data	Original Data Source	Periodicity	Last update	Notes
	Floods	Angola, STP	emdat.be	N/A	Annual	November 2021	Ongoing monitoring and reporting
Environmental (Natural disasters)	Droughts	Angola, STP	emdat.be	N/A	Annual	November 2021	Ongoing monitoring and reporting
	Rise in sea level	STP	climateknowledgeportal.worldbank.org	N/A	Annual	2021	Ongoing monitoring (noting medium and longer-term trends)

Official data sources

The data types in Table1 are presented along with their originating sources, highest frequency and last update date.

'Official data' refers to data that originates in the government department or ministry that has responsibility for a particular silo. This is, in essence, 'original' data since it would be captured on the information systems of that department/ministry and then distributed publicly via a government internet portal.

Unfortunately, in the case of our two countries, such data either does not exist or has not been published. It was possible to locate government websites for both countries, but in the case of Angola (Angola Government 2021), the individual ministry web pages are not accessible to the public and in the case of São Tomé and Principe, the portal is still under construction (São Tomé and Principe Government 2021). This highlights the need for training, capacitation and support for government officials charged with collecting, interpreting and disseminating data.

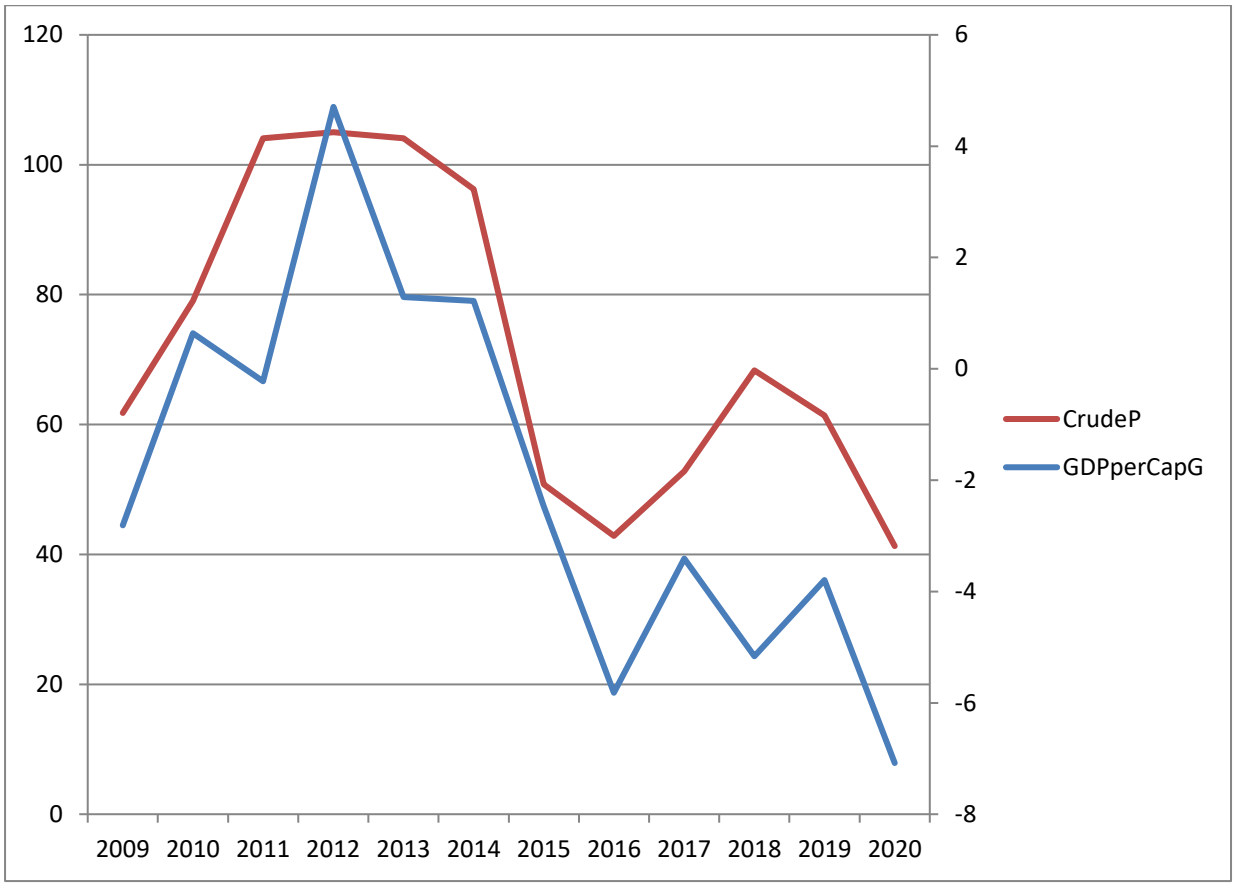
Vulnerabilities to crises and crises experienced

Economic crises

All countries are to some extent vulnerable to 'contagion' from economic crises originating in the developed countries and regions. The smaller and more open an economy, the more likely this contagion is to impact the demand for the small country's exports, thereby leading to a multiplied negative effect on output, income and consumption in that country.

This phenomenon can be ably demonstrated using data for our two countries.

Figure 1: Crude oil price (LHS axis) vs Angola GDP per capita growth (RHS axis): 2009-2020

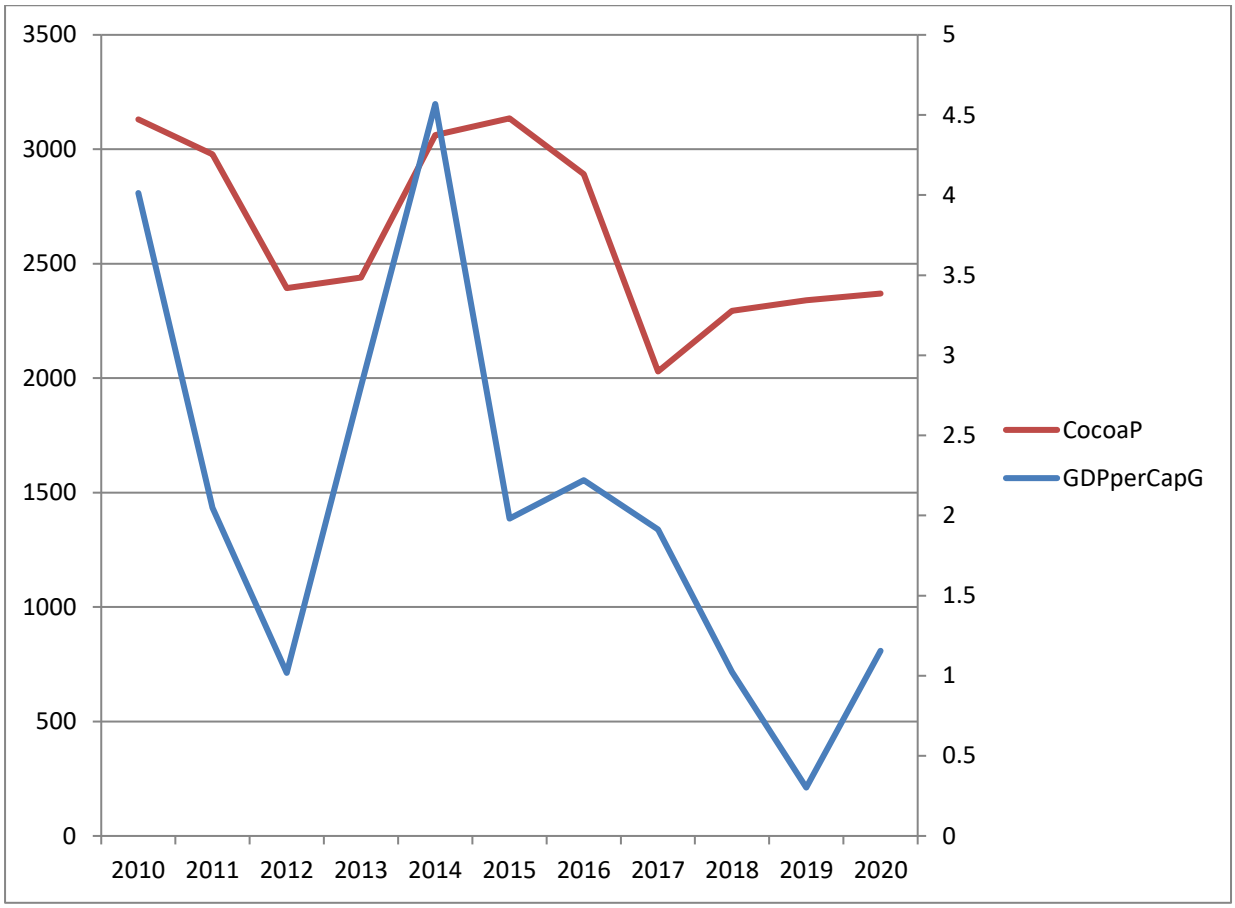


Source: Raw data from IMF (2021) and World Bank (2021)

Figure 1 presents data for the crude oil price against the growth rate in per capita GDP for Angola, for the period 2009 to 2020. As can be seen, the commodity cycle's effects on the oil price have closely-tracking effects on the country's GDP per capita. These fluctuations as a consequence of the normal commodity cycle illustrate the sensitivity of an undiversified, small open economy to exogenous global shocks and movements. An economic crisis such as the 1998 Asian financial crisis, which led to a 35% drop in the crude oil price, could be expected to have significant impacts on the economic welfare of such a country.

Comparable data is presented in Figure 2 for STP. In this case, the cocoa price is plotted against real GDP per capita for the period 2010-2020. It is evident that there is an association between fluctuations in the exogenous cocoa price and real GDP per capita, with the period 2010-2014 showing the cocoa price preceding, or coinciding with changes in real per capita GDP. After 2015, the two indicators still roughly move in the same direction, but there are clearly other factors at play that drive movements in GDP per capita.

Figure 2: Cocoa price (LHS axis) vs STP GDP growth per capita (RHS axis): 2010-2020 (dual axes)



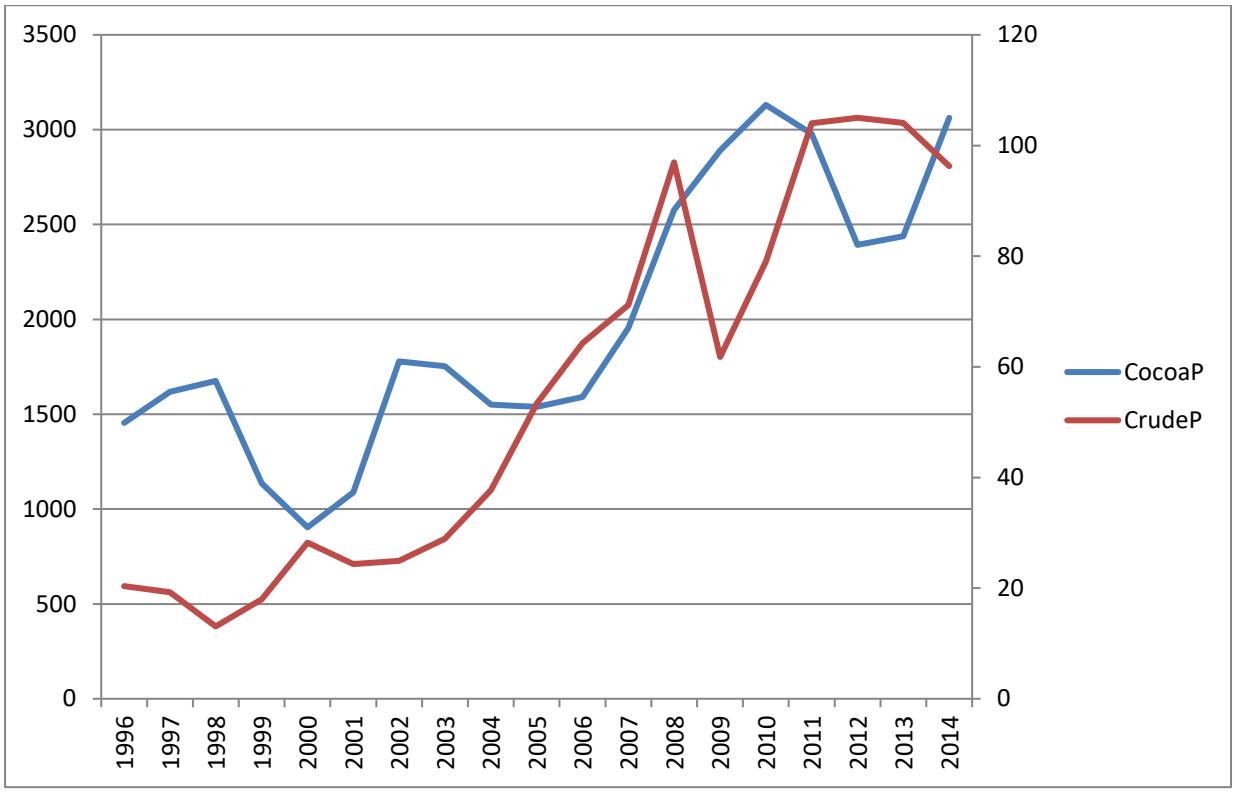
Source: Raw data from IMF (2021) and World Bank (2021)

Both countries have been impacted recently by economic crises, but not in the same way each time. Two economic crisis have occurred within the range of the data available for the two countries:

1. The East Asian financial crisis of 1997/98. This crisis began in July 1997 with the forced unpegging of the Thailand currency, followed by devaluations, debt default and capital flight firstly in Thailand and subsequently in other East Asian countries. One of the consequences was a large proportional drop in the price of oil (more than 40%), which was already at relatively low levels. The price of cocoa did not immediately fall, but the following year it went into a two-year slide, ending about 40% lower in 2000.
2. The global financial crisis (GFC) of 2007/8 was caused by overinflated asset markets due to speculation and reckless lending in the context of poor oversight and regulatory failure. Prior to the crisis, oil had been at all-time price highs, but the crisis caused price pullbacks of over 100%[1] in the oil price. Interestingly, the cocoa price continued to rise in the aftermath of the crisis, but at marginally reduced rate, indicating that expected or actual supply shortages may have led to sustained upward price pressure. These two price time series are plotted in Figure 3.

[1] The prices plotted in Figure 3 do not reflect the extremes of within-year prices because they are averaged.

Figure 3: Oil (RHS) and cocoa price (LHS) movements during two global economic crises - 1996 – 2015 (dual axes)

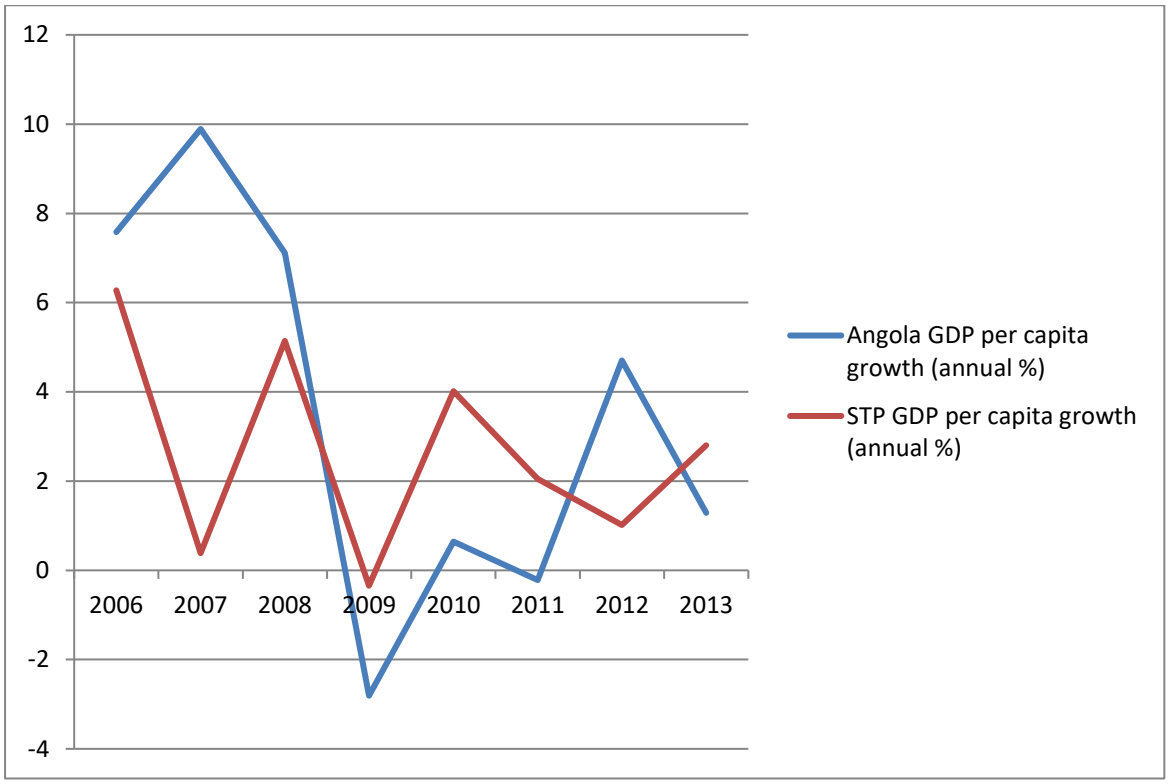


Source: IMF (2021)

The differential outcomes for oil and cocoa prices following the GFC are also reflected in the outcomes for our two countries of interest. Figure 4 reveals that Angola's per capital real GDP growth fell from just under 10% in 2007 (on the back of booming oil prices) to nearly -3% in 2009, as the full brunt of the GFC was born.

On the other hand, Figure 4 shows that the impact to STP's real per capital GDP was less than half this. It was seen above that the cocoa price did not drop like the oil price did, but it is likely that volumes dropped due to the global recession. This, together with the negative impacts of the GFC on global tourism (UNWTO 2013), would have accounted for STP's drop from 5% real per capita GDP growth in 2008 to a negative value for 2009.

Figure 4: The effects of the Asian Financial Crisis on real per capita GDP in two countries



Source: World Bank (2021)

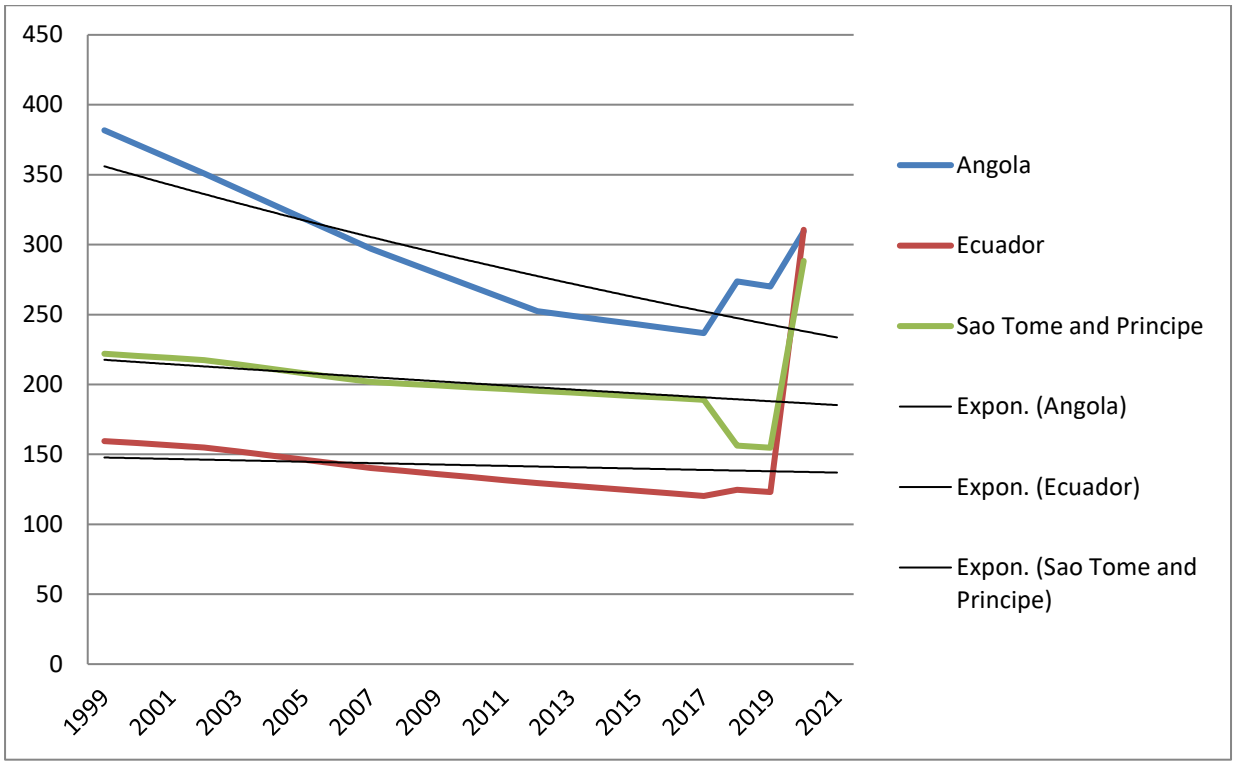
It may be concluded that both countries are vulnerable to economic crises as a consequence of their economically small, open nature. Angola is an extreme export specialist, with crude oil accounting for 94% of its export earnings. It is therefore extremely exposed to the vagaries of the global oil market, which in turn is very sensitive to global economic and financial sentiment.

STP is exposed to the global markets for tourism and the cocoa market. The latter is more stable, given the nature of the demand for cocoa-based products. Tourism, however, is more sensitive to the global business cycle and always experiences pullbacks in times of global financial recession.

Health crises

The Covid-19 pandemic, which is still current at the time of writing, is the first major global health pandemic in 100 years. No part of the globe has not been impacted in some way by the pandemic, and Angola and STP are no exception. Both Angola and STP implemented lockdown, quarantine, travel restrictions and social distancing regulations in line with many other African countries (IMF 2020 and Garda World 2020). However, the impacts on mortality were dissimilar for these two countries.

Figure 5: Mortality rates and trend lines in three developing countries: adults per 1000 population (1999 – 2020)



Source: World Bank (2021) and Knoema (2021)

Figure 5 presents the time series for adult mortality rates in these two countries (as well as, for comparative purposes, for Ecuador, which is one of the worst pandemic-impacted developing countries and will be referred to in a later section) for the period 1999 to 2020. Although mortality data in itself does not necessarily indicate the cause of death, it is generally accepted that 'excess deaths' (the differences between the trend mortality rate and the actual rate) in pandemic years are attributable directly or indirectly to Covid-19 (CDC 2021). Exponential trend lines are plotted in Figure 5 in order to assist with gauging the excess death magnitudes in the pandemic year 2020.

Angola, which has by far the higher overall mortality rate of the country comparison, experienced a 13% increase in mortality for the pandemic year 2020. By contrast, STP's rate increased by 87% and Ecuador's by 154%. The interesting result is that all three countries experienced a similar adult mortality rate in 2020, even though Angola's base was much higher. This suggests that Angola was least impacted by the pandemic, in terms of the mortality indicator, whereas the economic impact of the fall in the price of oil was certainly felt.

Natural disasters

Both Angola and STP display particular vulnerability to natural disasters. Both countries are vulnerable to droughts and floods – coastal, flash and river floods, and for STP rising sea levels carry impacts for the tourism industry and salt water flow into undergound aquifers taking the impact to agriculture. These disasters have significant impact on several development indicators such as lives lost, food production (the notable reliance in STP, for example on

school feeding programmes demonstrates the impact of these disasters), agricultural land degradation, and population displacement, which is particularly important in the case of Angola. Flash floods in Angola cause notable numbers of fatalities, due to factors such as electrocution and collapse of homes (floodlist 2021).

Development of an early warning system for crises

The underlying logic for the development of the early warning systems for the three areas of crises will be the past actual experiences with crises and the data indicators of crises. That is, the forgoing information and data on the nature of crises experienced, and their drivers, will form the bases of the early warning systems.

Economic crises

The economic crisis EWS will be based on the high frequency data presented above in Table 1 and the relationships observed in Figure 1 and Figure 2. That is, the high frequency commodity price data, exchange rate data and liquidity data will be used to construct a quantitatively-based EWS.

Methodology

When sufficient reliable data is available, a tried and trusted methodology for building a crisis predictive model is the econometric binary dependent variable estimation (Edelthalhammer *et al* 2016: 3). For both countries, annual data is used to determine the relationship between the high frequency indicators and the chosen indicator of economic welfare – real GDP per capita growth. This approach is used to confirm suspected intuitive relationships that have already been demonstrated using less formal means such as charting. The goal is to identify:

- One or more 'leading indicators' of crises; that is, an indicator that changes before the objective indicator of economic welfare. Failing which,
- A 'coincident indicator'; that is, an indicator that coincides with the change in the objective indicator of economic welfare, *but which is potentially more observable/more accessible/more frequent than the objective indicator*.

The chances of identifying leading indicators increase the higher the frequency of the data. If only annual data is available, what is in fact a leading indicator of say, 6 months, will appear to be a coincident indicator. Nevertheless, if such 'coincident' indicators – which are intuitively and in effect leading indicators - can be identified and are available in higher frequency, they may form the basis of an effective EWS.

The Probit model form that is estimated has a binary indicator of economic crises as a dependent variable, where the value is '0' for non-crisis years and '1' for crisis years. This variable is named 'CRISISBIN'. The formula for determining the binary value is based on thresholds for the continuous variable real GDP per capita growth. For example, if real GDP

per capita growth turns negative in a year, that threshold is used to give a value of '1' for the binary dependent variable, that is – a crisis year.

Angola

Of the two countries under study, Angola has the better data in terms of the length of its time series. It was possible to estimate a Probit model using 28 years of data spanning from 1993 to 2020. The econometric results are given in Table 2. According to these results, the two indicators – CRUDEP (the price of crude oil) and AGOEXR (the Angola/US$ exchange rate in local currency) are able to explain about 24% of variation in the economic crisis binary variable. Both indicators have the expected signs and are significant at or close to the 95% confidence level and the overall regression is significant at the 99% confidence level. The best formulation of the regression did not require the international liquidity variable or any lags. However, intuitively these two indicators are leading or coincident indicators and so they can form the basis of an EWS for Angola for economic crises.

In the case of the exchange rate, it is uncertain whether it leads, coincides or lags a crisis. Developing countries' exchange rates also depreciate in the wake of an economic crisis, as lenders and investors withdraw their capital and the currency is traded 'short'. Therefore, although the exchange rate should certainly be monitored, the primary indicator of imminent economic crisis for Angola should be regarded as the oil price. Any significant drop in the oil price should be regarded as a red flag for economic crisis in Angola.

Table 2: Econometric results for Angola

Dependent Variable: CRISISBIN
Method: ML - Binary Probit (Quadratic hill climbing)
Sample: 1993 2020
Included observations: 28
Convergence achieved after 5 iterations
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.060986	0.490293	0.124388	0.901
CRUDEP	-0.023559	0.012021	-1.959861	0.05
AGOEXR	0.013755	0.007159	1.921368	0.0547

McFadden R-squared	0.242152	Mean dependent var	0.464286
S.D. dependent var	0.507875	S.E. of regression	0.448043
Akaike info criterion	1.261016	Sum squared resid	5.018557
Schwarz criterion	1.403752	Log likelihood	-14.65422
Hannan-Quinn criter.	1.304652	Deviance	29.30845
Restr. deviance	38.67326	Restr. log likelihood	-19.33663
LR statistic	9.364814	Avg. log likelihood	-0.523365
Prob(LR statistic)	0.009257		

Source: Authors' calculations using World Bank (2021) and IMF (2021) data

A final observation on the econometric data is that although the oil price appears to have a stronger impact on the crisis dependent variable than the exchange rate, this is not necessarily the case given that the independent variables were not normalised but left in their raw form.

São Tomé & Principe

A similar process was followed to develop the EWS for STP. In place of the oil price, the cocoa price was used; but the exchange rate and real GDP per capita growth rates were used as with the Angola model. However, in addition to these, a third independent variable was used – STP's exports of travel services, a proxy for economic activity in the tourism sector.

In the case of STP, data availability is a significant challenge. Whereas it was possible to obtain 28 years of data for Angola, for STP the following constraints hold:

- GDP per capita data is only available from 2002 to 2020 (19 data points)
- Travel services exports data is only available from 2005 to 2020 (16 data points)

Given these information constraints, it is unlikely that the econometric model will be able to perform at a level similar to Angola's. Regression results are presented in Table 3

Table 3: Econometric results for STP

Dependent Variable: CRISISBIN
Method: ML - Binary Probit (Quadratic hill climbing)
Sample (adjusted): 2005 2020
Included observations: 16 after adjustments
Convergence achieved after 7 iterations
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.912474	2.289377	-0.398569	0.6902
COCOAP(-1)	-0.001243	0.001104	-1.126445	0.26
STPEXR	0.208702	0.197235	1.058139	0.29
TRAVEL	-3.05E-05	2.82E-05	-1.080797	0.2798

McFadden R-squared	0.158256	Mean dependent var	0.1875
S.D. dependent var	0.403113	S.E. of regression	0.427624
Akaike info criterion	1.312413	Sum squared resid	2.19435
Schwarz criterion	1.505561	Log likelihood	-6.499307
Hannan-Quinn criter.	1.322304	Deviance	12.99861
Restr. deviance	15.44248	Restr. log likelihood	-7.721241
LR statistic	2.443869	Avg. log likelihood	-0.406207
Prob(LR statistic)	0.485521		

Source: Authors' calculations using World Bank (2021), ITC (2021) and IMF (2021) data

Although these results would appear to be too 'weak' to form the basis of a research paper or a policy analysis, the fact that they are an exercise in the confirmation of intuitive beliefs about how crises may be predicted in STP lends some reassurance. All three regressors are significant at at least the 30% level and have the correct sign. In addition, the best formulation has the cocoa price at one lag, meaning it leads economic crises by more than 12 months.

The conclusion would be that the EWS for STP for economic crises indicates that the following should be monitored as leading indicators of crises:

1. A significant deterioration in the cocoa price
2. A significant drop in travel services exports from STP.

For the same reasons as were given in the case of Angola, an exchange rate depreciation may or may not lead an economic crisis so this indicator could be monitored but with a lower priority.

Health crises

Whilst it would be desirable to replicate the same EWS methodology for health crises, comparable data is unfortunately not available. Table 1 lists several types and sources of health data that are available for Angola and STP, however, no configuration of known leading/coincident indicators and dependent variable is possible with the available data. In addition, given that health crises can arise from multiple sources – such as global pandemics, local water contamination or outbreaks of infections, there is no convenient template for a health EWS as there is in the case of economic crises.

These considerations indicate that a high frequency, coincident or closely lagging indicator is the most viable option. Our view is that the best option is to use monthly data for pharmaceutical imports by STP, where the mirror rather than the direct data is required as direct data is not updated frequently enough. To test this supposition, we plotted this data for our two countries as well as Ecuador, a developing country particularly hard hit by the Covid-19 pandemic (Reliefweb 2021).

Since the raw monthly data is subject to ordinary volatility, a variety of smoothing transformations were undertaken to attempt to identify the one that best revealed the underlying movements. Ultimately, the transformation that was settled on was the deviation from a three month centred moving average of pharmaceutical imports (HS30), with raw data sourced from the ITC (2021). Plots of this data for our two countries plus Ecuador are given in Figure Group 1.

What is immediately evident is the fact that all three countries' data show a spike in July 2020, a point in time where the Covid-19 impacts would have been particularly intense. This is followed by a lesser spike for Angola at the end of 2020, with the other two countries showing sharp spikes at the tail ends of the data – June 2021, although July's data is implicit in the CMA calculation as well.

Although relatively simplistic compared with the rigorous approach taken with the economic crises EWS, it is our belief that this approach is the most viable for health crises for our focus countries. Our countries are highly dependent on imports for their pharmaceutical products and any health crisis that required medication of any sort would reflect in the imports data as shown. This data can be accessed from the Trade Map data portal at no cost by citizens of developing countries and can be transformed relatively easily into the formats suggested. The EWS would involve updating the data every month and monitoring for spikes in the order of magnitude of those caused by the Covid-19 pandemic ridden months in 2020 and 2021.

Natural disasters

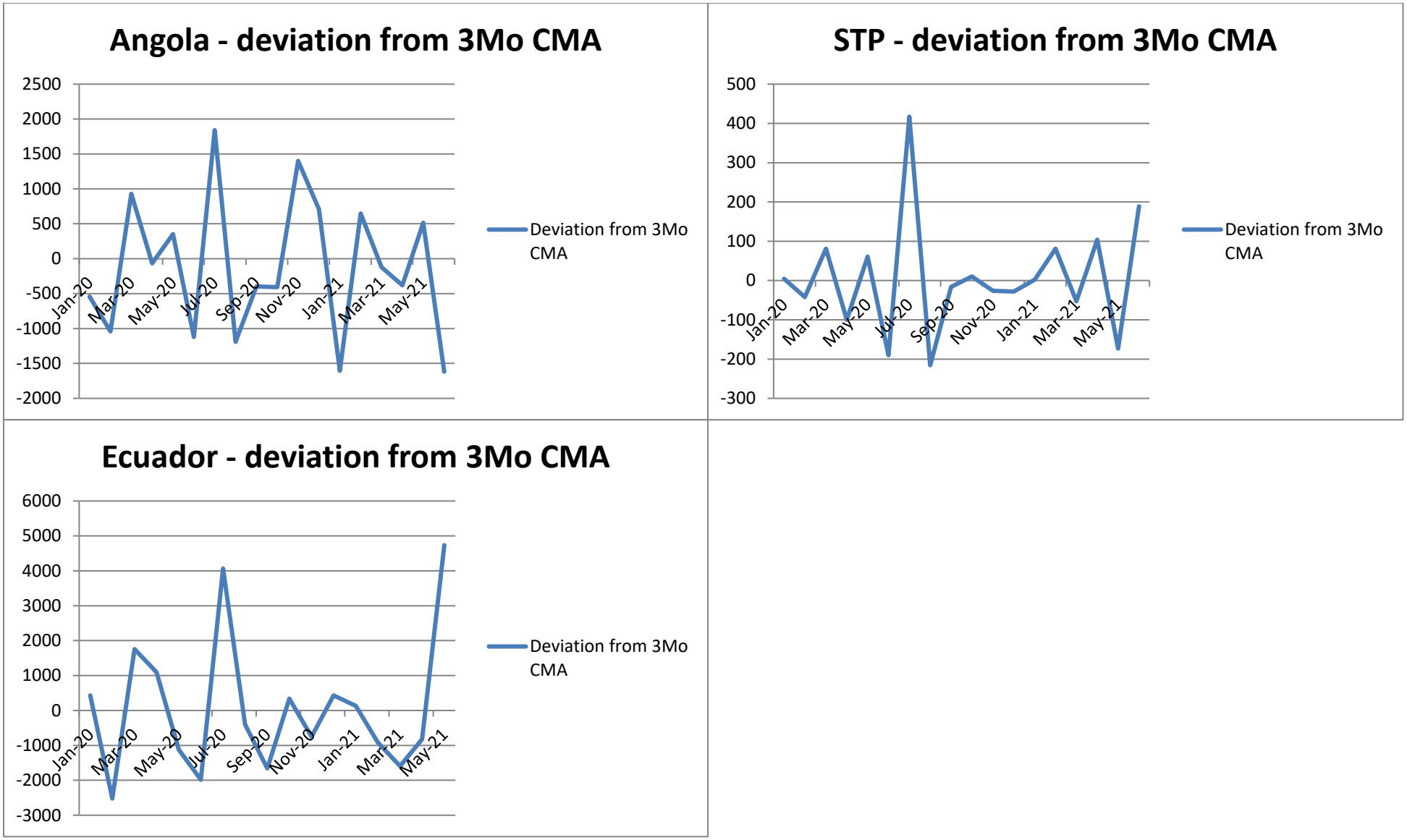
For natural disasters, data is usually reported as event-coincident, together with longer term data series. Continuous monitoring of key indicators such as floods (coastal and river, as well as flash floods) are important for both Angola and STP. For Angola recorded floods in recent years have impacts, in some cases more that 100 000 people. For STP floods may occur 10 times or more, and a single flood may impact over 20 000 people. Droughts are also notable disasters for both and STP. Temperature rises have in recent years become a key factor for STP.

Data collection, training and monitoring

Training, to enhance monitoring as well as data collection and processing, can play an important role in the development of disaster management and resilience development strategies. For Central Africa, a Regional Climate Centre was established in 2015, in Douala, Cameroon. In collaboration with the Parliamentarians Network for Resilience to Disasters in Central Africa (REPARC), the aim is to develop the capacity to manage disasters, focusing on prevention, preparedness response and recovery in the members of the Economic Community of Central African States (ECCAS) to which STP belongs.

The Southern African Development Community (SADC) to which Angola belongs has established a Disaster Risk Reduction Union, which coordinates regional preparedness and response programme for trans-boundary disasters. A regional Platform for Disaster Risk Reduction was established in 2011. National Vulnerability Assessment Committees coordinate SADC's annual vulnerability assessment and analysis, and an Online Vulnerability Atlas was launched in July 2021.

Figure Group 1: Pharmaceutical monthly imports for three countries: deviation from three month centred moving averages (Jan 2020 to Jun 2021)



Source: Authors' calculations on data sourced from ITC 2021

Conclusion and summary of recommendations

This report has investigated the causes of economic and health crises in two graduating LDCS: Angola and STP. Due to their small, open nature, as well as their domestic developmental and health challenges, both nations are vulnerable to crises in these areas. In addition, there are feedback effects between indicators and types of crises, for example, a natural or health disaster could lead to a slump in tourism, which would contribute to an economic crisis. Similarly, an economic crisis could lead to greater levels of hardship and poverty, contributing to a health crisis. Droughts, for example, increasingly affect both Angola and STP, with severe impact on livelihoods and food security. The incidence and length of droughts, as well as linked indicators such as food production and security, displacement and migration can serve as indicators of crisis. For these reasons the monitoring system should consider the variables in an integrated manner; the linkages and relationships among the indicators provide a more effective and informative overview of vulnerability and risk.

The indicators and thresholds proposed are presented here.

For Angola, the economic crises indicators are:

- **Oil price (US$ average of three prices, monthly, source IMF)**: any drop of 30% or more has been associated with a significant drop in per capita GDP growth. Since the price may drop in stages and not precipitously, a cumulative price change indicator, taking into account 2-3 months of movements, needs to be monitored.
- **Exchange rate (local currency per US$, monthly, source: IMF)**: any depreciation over 10% has been associated with a drop in per capital GDP growth. However, the exchange rate change is usually associated with changes in the crude oil price, so the primary indicator to monitor is the crude oil price. Again, a cumulative changes indicator should be used.

For STP, the economic crises indicators are:

- **Cocoa price (US$ per metric ton, monthly, source: IMF)**: Any drop of 20% or more has been associated with a significant drop in per capita GDP growth. Since the price may drop in stages and not precipitously, a cumulative price change indicator, taking into account 2-3 months of movements, needs to be monitored. Note that this indicator clearly leads economic crises, and so could be expected to give more advanced warning than the other indicators.
- **Travel services exports (US$000, quarterly, source: ITC)**: Although data is limited, the importance of this indicator for the economy of STP suggests that it needs to be

monitored. Any drop of 30% or more should be regarded as a warning for the economy of STP. Only quarterly data is available, but this also means that cumulative data does not have to be monitored and the raw value is the proposed indicator.

- **Exchange rate (local currency per US$, monthly, source: IMF)**: Two depreciations over 7% have been associated with a drop in per capita GDP growth, although the data points are not extensive. A cumulative price change indicator, taking into account 2-3 months of movements, needs to be monitored

For both countries, the following is suggested as the health crises indicator:

- **Pharmaceutical imports (HS30) (US$ 000, monthly, source: ITC)**: Although our crisis indicator was based on a centred moving average, the indicator for the EWS should be based on the latest data, for maximum efficacy. Using the data for Angola, STP and Ecuador, we propose the indicator be formulated as *the percentage increase of the current month over the average for the previous three.* Any increase of 33% or more in this indicator should be regarded as an indicator of a potential crisis.

For both countries, the following is suggested as a key natural disaster indicator:

- **Floods (coastal, river and flash floods, data source: emdat.be**); we propose that the severity and incidence of floods. Both are noted as indicators of potential crisis (with specific impact leads: lives lost, decrease in food production, damage to agricultural land and property). It should be noted that the risk and severity of floods, are closely linked to migration (including in-country) as well as socio-economic development patterns. For Angola, the indicator of potential crisis is suggested as **20 000** people or more. For STP, the threshold is suggested as **10 000**.

Finally, the analysis of indicators and thresholds was based on data accessed from international bodies such as the World Bank, the IMF, the International Disaster Database (EM-DAT) and the International Trade Centre. It was noted above that neither country publishes official data on the internet, from which it would be available to analysts and as inputs to an EWS. This underscores the need for training, capacitation and support for government officials charged with collecting, interpreting, and disseminating data.

Ideally, a single national entity would be entrusted with coordinating data collection from the various ministries and integrating it into the EWS. Implementing this would assist not only in maintaining an effect EWS, but also in generating feedback on the success of service delivery and the progress of government policies and agendas. Both countries belong to regional economic communities that have programmes for disaster risk management, and country-level focal points to contribute to the regional initiatives. Possible roles for the focal points in the national EWS strategy can also be explored.

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DEPARTMENT OF
ECONOMIC AND
SOCIAL AFFAIRS

Bangladesh

Report of the DESA project, "Establishing crisis response process in the LDC monitoring framework for graduating and graduated countries"

19 November 2021

This report was prepared under the capacity development activities of the Development Policy Branch (DPB), Economic Analysis and Policy Division (EAPD), United Nations Department of Economic and Social Affairs (DESA). The Project is funded by the Regular Progamme of Technical Cooperation. Inputs from the project consultant Mohammad Masudur Rahman is gratefully acknowledged. For more information, please contact Namsuk Kim, EAPD/DESA (kimnamsuk@un.org). The content, findings, interpretations and conclusions as expressed in this report do not necessarily represent the views of the United Nations or the Government of Bangladesh.

Introduction

Bangladesh is one of the leading emerging economies in South Asia, with a steady average economic growth rate of about 6.5 percent over the decade. It has managed to maintain a growth rate of about 3.5 percent during the pandemic in 2020.[1] The country has made huge strides in the areas of Gross National Income (GNI) per capita, Human Asset Index (HAI) and Economic Vulnerability Index (EVI) over the years. As a result, Bangladesh was recommended for graduation from the Least Developed Countries (LDC) status by the Committee for Development Policy (CDP) of the UN Economic and Social Council on 25th February 2021.[2]

Graduation is an uphill journey, especially phasing out of the transition period, as Bangladesh will lose its preferential market access in most global markets. The country also aims to become an upper-middle-income country by 2031 and a developed nation by 2041, as laid out in the Perspectives Plan 2021-2041 of the Bangladesh Planning Commission.[3] To achieve this ambitious goal, it is critical that Bangladesh has a smooth graduation transition strategy and the disruptions from graduation do not hinder their larger developmental goals. In this context, the main objective of this study is to identify the most important high frequency socio-economic indicators that need to be monitored for tracking the developmental progress of Bangladesh and identify the potential risks that could disrupt Bangladesh's growth. Thus, the specific objectives and scope of the study are:

- ✓ To review the current socio-economic structure of Bangladesh and identify the strengths as well as the vulnerabilities of the State.
- ✓ To review existing national indicators/systems in place and identify ten high-frequency indicators as the crisis monitoring indicators covering three categories – a) macroeconomics, b) natural disasters and c) health and other emergencies. The most critical indicators for each of the categories will also be highlighted; and

[1] Extracted from Bangladesh GDP annual growth rate, Tradingeconomics.com; https://tradingeconomics.com/bangladesh/gdp-growth-annual

[2] Committee for Development Policy: Report on the twenty-third session (22-26 February 2021), Economic and Social Council, Official Records 2021, Supplement No. 13, E/2021/33, United Nations; https://undocs.org/en/E/2021/33

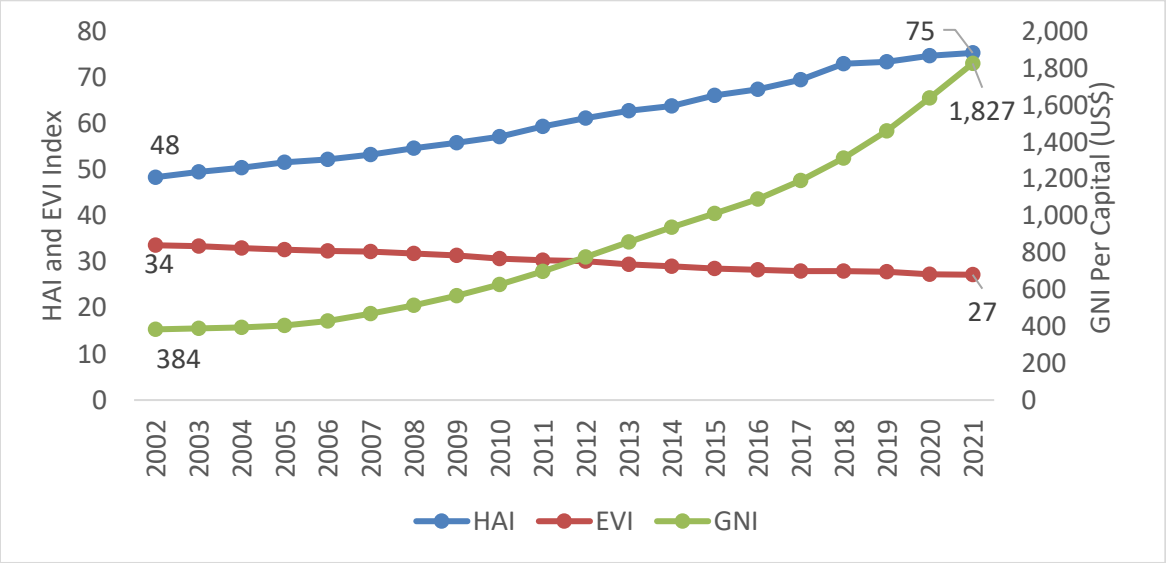
[3] Making Vision 2041 a Reality: Perspective Plan of Bangladesh, 2021-2041, Bangladesh Planning Commission, Ministry of Planning, Government of the People's Republic of Bangladesh, March 2020; http://oldweb.lged.gov.bd/UploadedDocument/UnitPublication/1/1049/vision%202021-2041.pdf

- ✓ To analyse each indicator and identify an average threshold level that can be used as a trigger value for indicating crisis.

Socio-economic Structure of Bangladesh

Bangladesh has made significant progress on GNI per capita, HAI,[4] and EVI.[5] The GNI per capita has increased five-fold over two decades (Figure 1). With respect to GNI per capita, the graduation threshold is US$ 1222, and Bangladesh's is at US$1827 in 2021. The country has also surpassed Pakistan and India in GNI per capita.[6] However, compared to developing countries (US$ 6666) it is still much lower.[7]

Figure 1. Trend of HAI, EVI and GNI per Capita



Source: UN CDP database, Accessed on 10 September 2021 (Triennial review report)

[4] The HAI comprises six social indicators which are (1) Under-five mortality rate, (2) Gross secondary school enrolment ratio, (3) Prevalence of stunting, (4) Adult literacy rate, (5) Maternal mortality rate and (6) Gender parity index for gross secondary school enrolment.

[5] Lower the index, lower the risk. The EVI comprises eight indicators which are (1) Share of agriculture, forestry and fishing in GDP, (2) Merchandise export concentration, (3) Instability of exports of goods and services, (4) Instability of agricultural production, (5) Share of population in low elevated coastal zones, (6) Remoteness and landlockedness, (7) Share of population living in drylands, (8) Victims of disasters.

[6] The CDP prepared the data for 2021 for a triennial review averaging the value of the last three years.

[7] "Least Developed Country Category: Bangladesh Profile", Department of Economic and Social Affairs Economic Analysis, United Nations; https://www.un.org/development/desa/dpad/least-developed-country-category-bangladesh.html

Bangladesh has made remarkable progress in its social and human asset development. The adult literacy rate has increased sharply over the decades and the mortality rate has also dropped significantly. As reviewed by the CDP, the HAI index for Bangladesh accounted for 75.3 in 2021, where the threshold level for graduation is 66. It's worth noting that the average HAI index for developing countries is 78.3 and Bangladesh is still behind the developing countries average.

The EVI shows how much a country is vulnerable in terms of economic and environmental shocks. Although the GNI per capita and HAI have substantially increased over the decades, EVI didn't decrease considerably due to environmental vulnerability. The EVI index was 34 in 2000 and was at 27 in 2021.[8] As Bangladesh continues to face different types of environmental shocks - both natural and human-related disasters - there is huge scope for improvement particularly in the area concerning environmental vulnerability. Table 1 shows different types of indicators that we use for this analysis.

Table 1 Potential Indicators for Crisis Monitoring.

SL	**Indicators**	**Measurement**	**Frequency**	**Threshold**	**Sources**
Economic Indicators					
1	Government revenue	% of GDP	Quarterly	≤ 3% of GDP	Economic Review (various issues), Ministry of Finance
2	Government Expenditure	% of GDP	Quarterly	≥4% of GDP	Economic Review, Ministry of Finance
3	Private Investment	% of GDP	Yearly	≤ 25% of GDP	Economic Review, Ministry of Finance
4	Current account balance	% of GDP	Quarterly	≤0	Quarterly Economic Trend, Bangladesh Bank (BB)
5	Inflation	Percentage change	Monthly	≥6%	Bangladesh Bank
6	Remittance	US$ Million	Monthly	≤ 2 billion per month	Monthly Economic Trend, BB
7	Overseas Employment	Number of persons per month	Monthly	≤ 50000 per month	Bureau of Manpower, employment and Training (BMET)

[8] *Ibid.*

8	Export	US$ Million	Monthly	≤ 3.5billion per month	EPB, Bangladesh Bank
9	Foreign Reserve	US$ Million	Monthly	≤30 bill or ≥ 6months import capacity	Bangladesh Bank
10	Rice Price	US$/ MT	Quarterly	≥10 % increase	Bangladesh Bank
11	Cotton Price	US$/lb	Daily/Weekly	≥5 % increase	Macrotrends
Social and Health Indicators					
12	Weekly Trend of Covid Case	Total number of positive cases	Weekly	≥1000 confirmed cases per week	Director General of Health Service, GOB
13	Productive capacity index	Index	Yearly	≥31 (same as Vietnam index level)	UNCATD PCI
14	Human Development Index (HDI)	Index	Yearly	≥0.7 which is South Asian average	HDI, UNDP and UNCDP
15	Current health expenditure	% Of GDP	Yearly	≥4 % of GDP	WDI, World Bank
16	Female labour force participation rate	% of total Pop	Yearly	≥50 of total population	WDI, World Bank
17	Government expenditure on education	% of GDP	Yearly	≥4 of GDP	WDI, World Bank
Environment and disaster related Indicators					
18	Flood/Cyclone/Strom (Natural)	Number of people affected	Yearly	≥ 100000	Compilation from EM-DAT, CRED/UCLouvain
19	Ferry accident/fire in the factories/ Human induced	Number accidents	Yearly	≤ 5	EM-DAT, CRED/UCLouvain, Brussels
20	New diseases	Number of new diseases	Yearly	New disease outbreak	EM-DAT, CRED/UCLouvain, Brussels

21	Air quality	AQI or PM 2.5 concentration	Daily	AQI >100 or PM2.5 >35.4 µg/m³	IQAir
22	Renewable electricity output	% of total electricity output	Yearly	≤10 %	WDI, World Bank; WDI, World Bank;
23	Access to clean fuels for cooking	% of population	Yearly	≤50%	International Energy Agency (IEA) dataset
24	Global Adoption Capacity	Global Adaptation Capacity Index	Yearly	≤40 (average index of LDCs)	University of Notre Dame-Global Adaptation Index (ND-GAIN)

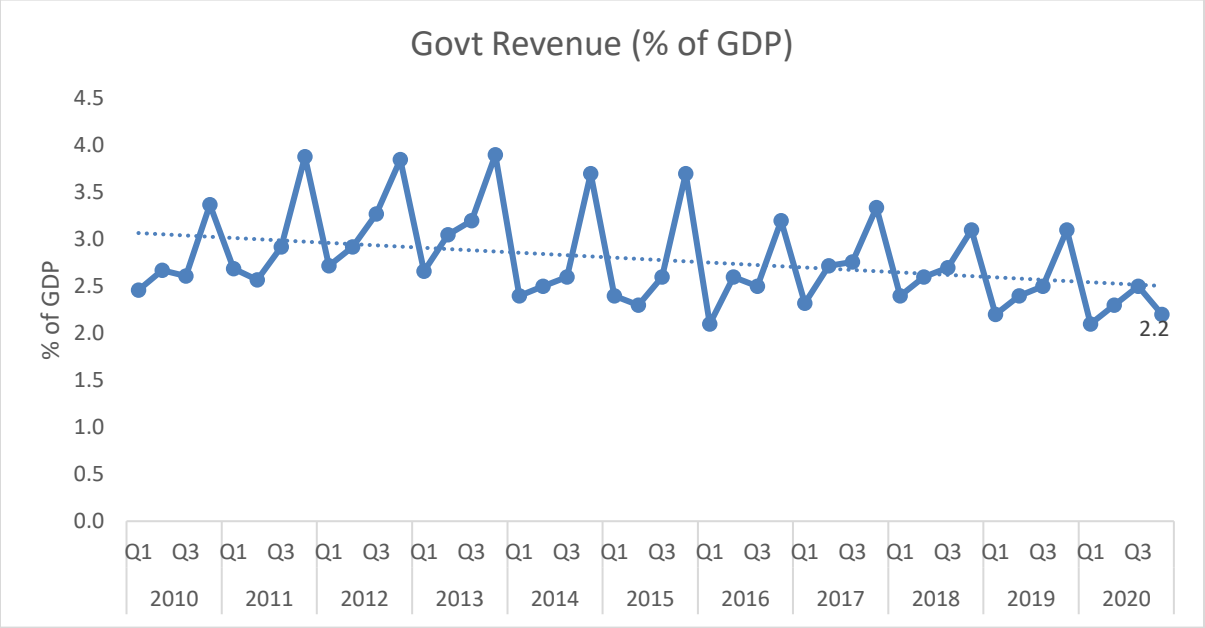
Source: Author's compilation.

A detailed justification of each indicator and suggested threshold level are discussed. However, relevant yearly indicators are presented in the Appendix.

1. Government Revenue

- **Justification**: The slow pace of revenue mobilisation and the simultaneous increase in government expenditure in response to the pandemic has created a stern fiscal challenge for Bangladesh. The government introduced a stimulus package amounting to US$15.1 billion which is 4.2 of GDP (Ministry of Finance, 2021), to recover the economy, which requires huge resource mobilization and government borrowings.
- **Frequency**: Quarterly
- **Measurement**: % of GDP
- **Source**: Various issues of Economic Review, Ministry of Finance
- **Threshold**: ≥3%. Figure 2 shows the quarterly moving average revenue collection is about 2.5 to 3 percent of GDP. In this regard, a minimum of 3% revenue of GDP is suggested for the quarterly threshold.

Figure 2: Govt Revenue as percentage of GDP (Quarterly)

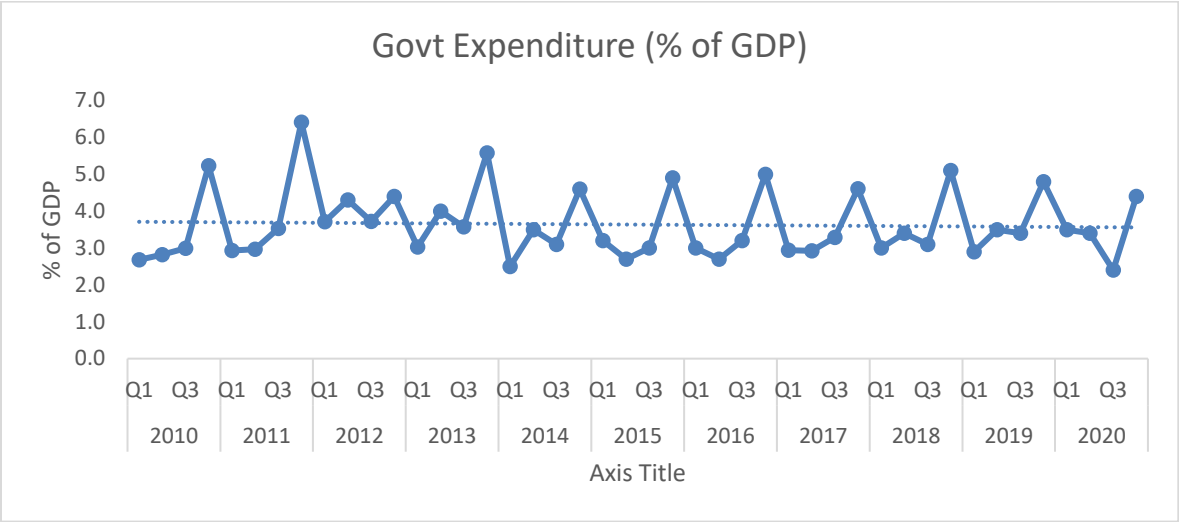


Source: Compiled from Bangladesh Economic Review (Various Issues), Ministry of Finance

2. Government Expenditure

- **Justification**: According to the 'Public Money and Budget Management Act 2009', the government should keep the budget deficit within 5 percent of GDP. In the revised budget of FY 2020, due to the 'COVID-19' pandemic, the budget deficit accounted for 5.5 percent of GDP and was forecasted at 6.1 percent for FY 2021. Government borrowed about 3.3 percent of GDP from domestic sources in 2020. In 2019, the figure was 2.9 percent (Ministry of Finance, 2021). These additional domestic borrowing could reduce potential domestic private investment and hence the government needs to monitor and maintain fiscal discipline to move forward.
- **Frequency**: Quarterly
- **Measurement**: % of GDP
- **Source**: Various issues of Economic Review, Ministry of Finance
- **Threshold**: ≥4% of GDP. Figure 3 shows the quarterly moving average government expenditure is about 4 percent of GDP. In this regard, 4% government expenditure of GDP is suggested for the quarterly threshold.

Figure 3: Govt Expenditure as percentage of GDP (Quarterly)



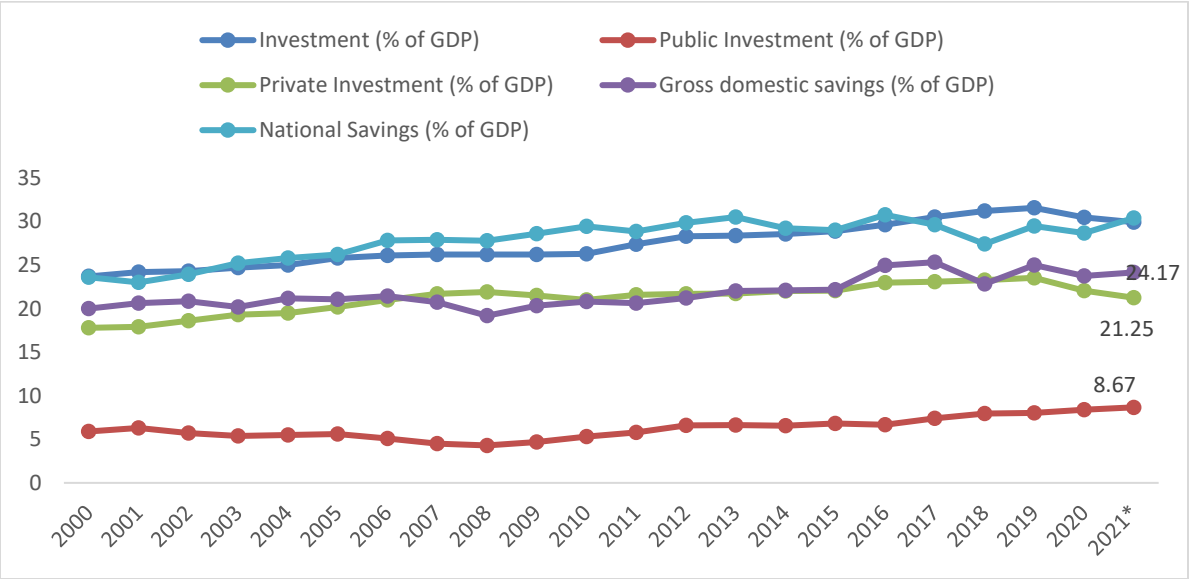
Source: Compiled from Bangladesh Economic Review (Various Issues), Ministry of Finance

3. Private Investment

- **Justification:** Savings and investment play a vital role in enabling capital that translates into long-term economic growth. Thus, it will augur well for Bangladesh to monitor and strategize to boost its saving and investment scenario as lower savings and investment may trap Bangladesh in the lower-income category. According to the provisional data, Bangladesh's domestic saving increased to 24.2 percent of GDP in the 2021 fiscal year from 23.8 percent in the preceding fiscal year. National savings also increased to 30.4 percent in 2021 from 28.7 percent in 2020. However, gross investment decreased in 2021 compared to the previous fiscal year. The total investment fell marginally in 2021 to 29.92 percent from 30.47 percent in 2020. Public sector investment has been growing at a decreasing rate and was at 8.67 percent in 2021.
- **Frequency**: Yearly
- **Measurement**: % of GDP
- **Source**: Various issues of Economic Review, Ministry of Finance

- **Threshold**: ≤25% of GDP. Figure 4 shows the quarterly moving average of private sector investment is about 24% of GDP. In this regard, 25% is suggested for the yearly threshold.

Figure 4: Private and Investment Trend



Source: Compiled from Bangladesh Economic Review (Various Issues), Ministry of Finance)

4. Current Account Balance:

- **Justification:** A positive current balance indicates the country is capable to payment its import bills. Bangladesh's trade to GDP ratio is 37 percent in 2020, reflecting its current robust integration with the global economy. Despite the deficit of current account balance, the overall balance achieved a surplus of US$ 7.5 billion during FY 2021 as stemmed by the surplus in capital and financial account. Due to the surplus in the overall balance, the foreign exchange reserve reached to US$ 50 billion in September 2021.
- **Frequency**: Quarterly
- **Measurement**: % of GDP
- **Source**: Various issues of Economic Review, Ministry of Finance
- **Threshold**: ≤ 0. Figure 5 shows the quarterly moving average current account balance (CAB). In this regard, a negative (≤ 0)CAB is suggested for the quarterly threshold.

Figure 5 (a): Quarterly Current Account Balance (US Million)

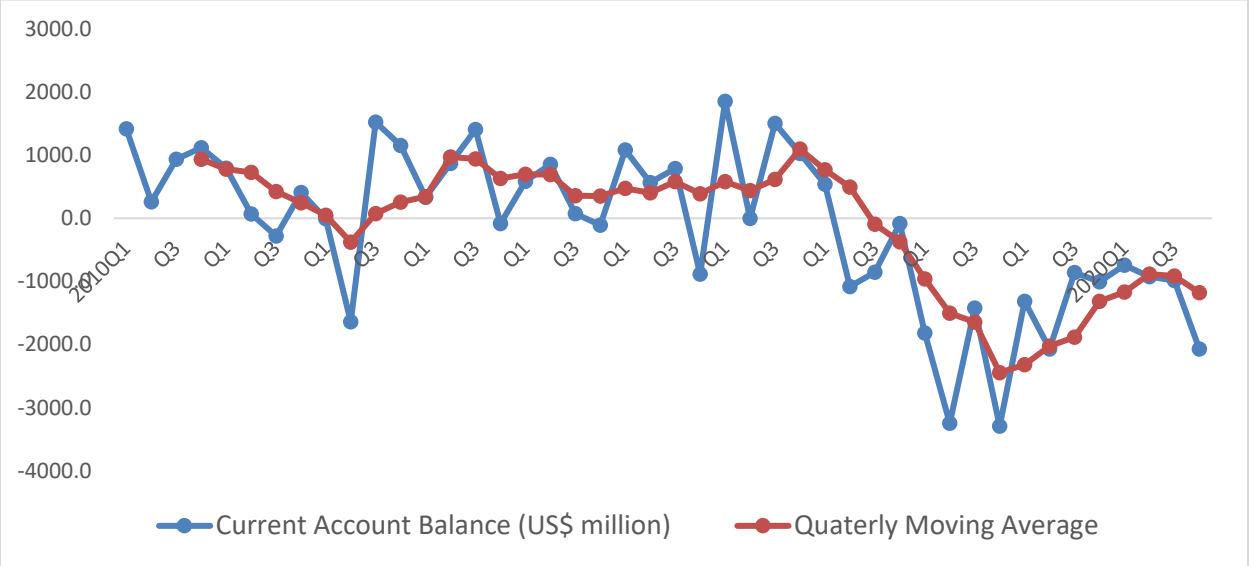
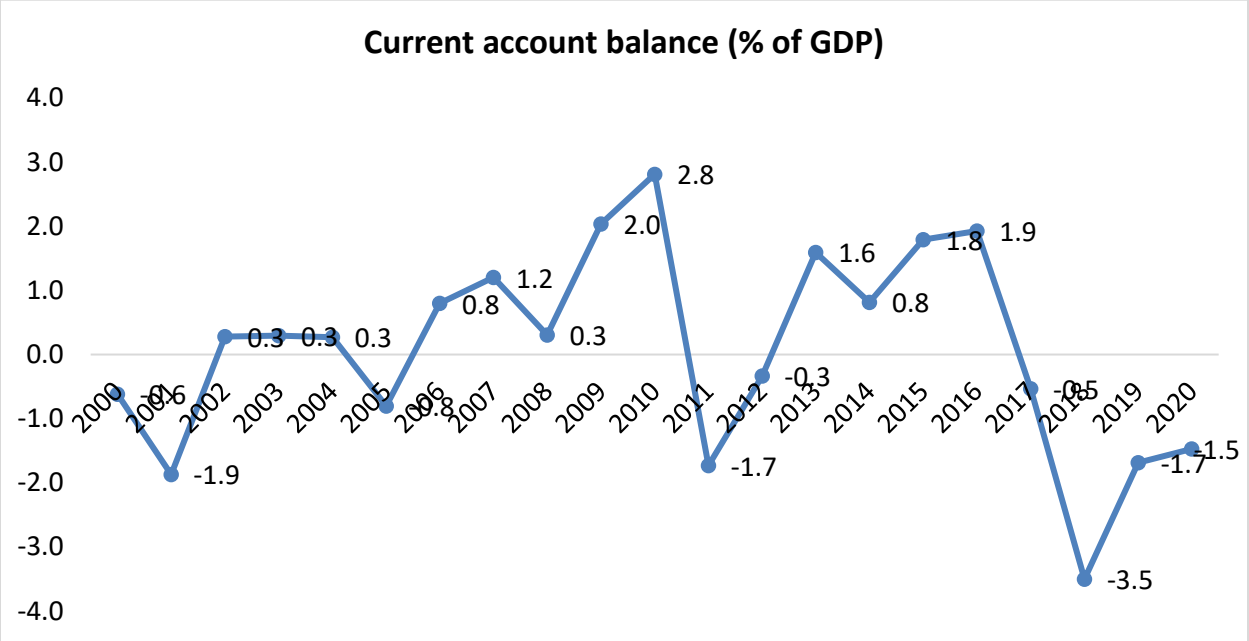


Figure 5(b): Current Account Balance (% of GDP)



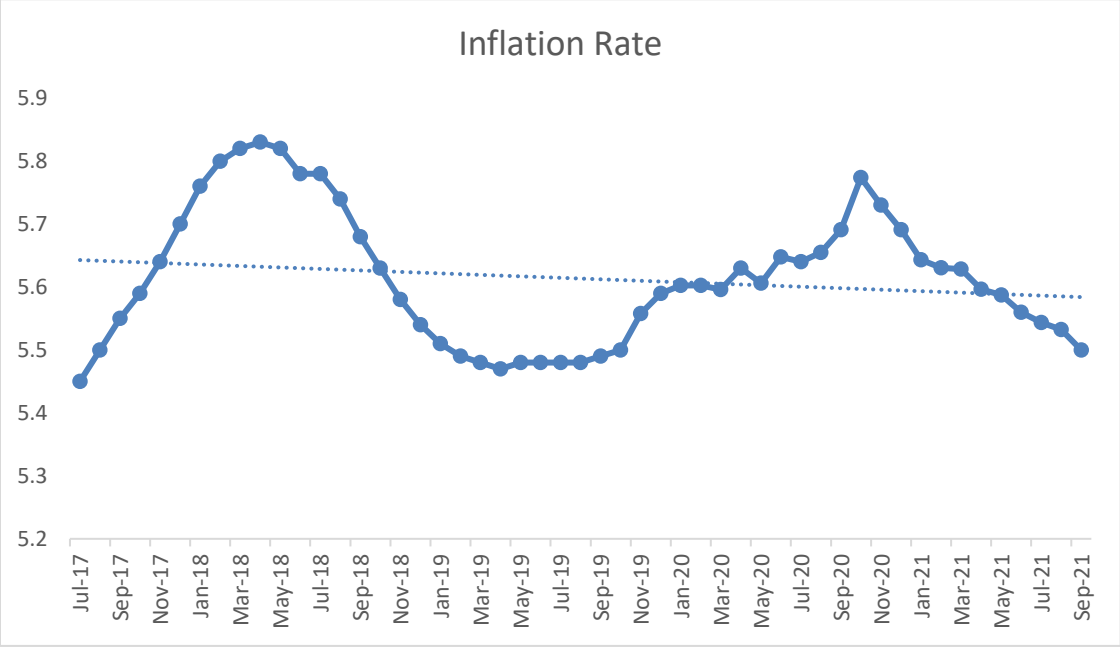
Source: Compiled from Bangladesh Bank Quarterly Economic Trend (Various Issues)

5. Inflation Rate

- **Justification**: Rising inflation rate increases the living cost of the locals. The rising cost of living has heavily impacted those with low incomes.
- **Frequency**: Monthly

- **Measurement**: Percentage Change
- **Source**: Bangladesh Bank
- **Threshold**: ≤6%. The average annual inflation is about 5.65% (Figure 6). The government target to keep inflation below six percent. In this regard, less than 6% is suggested for the monthly threshold.

Figure 6: Inflation Rate (12 months average)



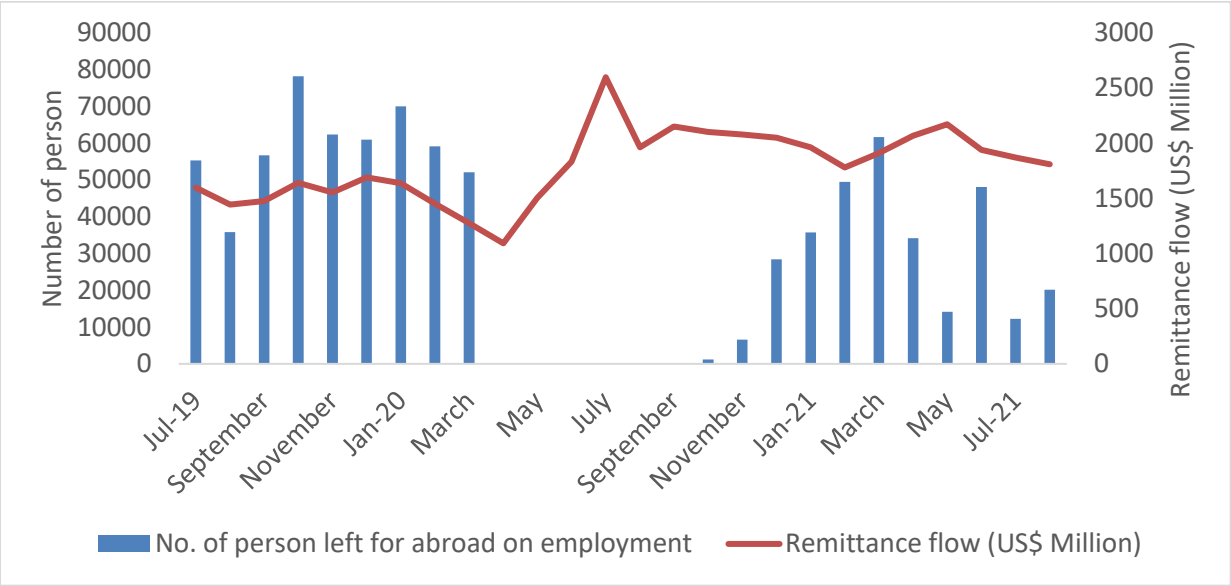
Compiled from Bangladesh Bank Monthly Economic Trend (Oct 2021)

6. Remittance

- **Justification:** Remittance is the lifeline of Bangladesh's economy. Bangladesh received an average of US$1.6 billion every month until the pandemic hit in 2020 (Figure 7). The wage-earner fell to US$ 1 billion in April 2020 and then bounced back sharply.
- **Frequency**: Monthly
- **Measurement**: USD billion
- **Source**: Bangladesh's Bank

- **Threshold**: ≤ 2 billion per month. Figure 7 shows the country receives about US$ 1.6 billion per month over the decades. In this regard, ≤ 2 billion per month is suggested for the monthly threshold.

Figure 7. Monthly Remittance and Overseas Employment



Source: Bangladesh Bank Monthly Economic Trend Sept 2021, Accessed on 4 Oct 2021

7. Overseas Employment

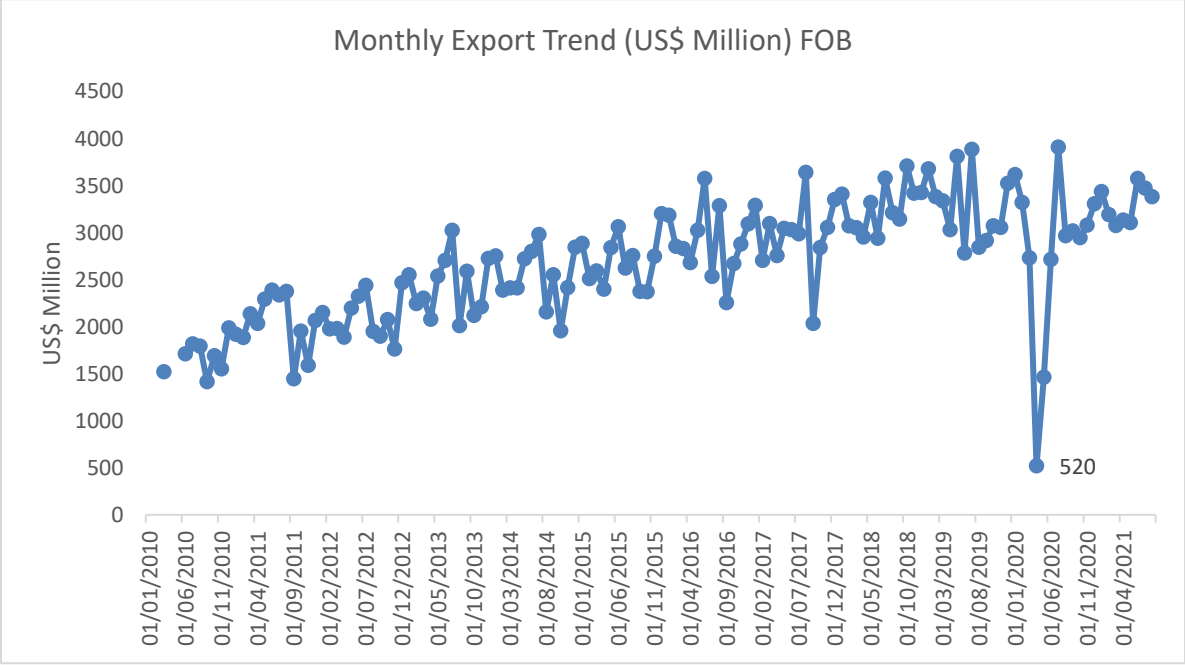
- **Justification**: The country sends, an average, about 58,000 people aboard to every month until the pandemic hit in 2020 (Figure 7). But not a single person migrated overseas to work from April 2020 to November 2020, although remittance inflow has increased suspiciously.
- **Frequency**: Monthly
- **Measurement**: Number of persons per month
- **Source**: BMET.
- **Threshold**: ≤ 50000 person. Bangladesh usually sends, on average, about 58,000 people aboard every month until the pandemic over the last decades. It suggested that ≤ 50000 people could be a threshold for overseas employment

8. Export:

- **Justification:** In the last decade, Bangladesh's total trade has increased from an estimate of US$ 15 billion in 2000 to US$ 110 billion in 2019 before it hit the pandemic.[9] Export earnings drastically fell by 13 percent to US$ 33.6 billion in 2020 compared to the previous fiscal year. The export sector has bounced back recently to its pre-pandemic level, which shows a strong recovery.

- **Frequency**: Monthly
- **Measurement**: US$ Million
- **Source**: Bangladesh Bank and Export Promotion Bureau.
- **Threshold**: ≤ 3.5 billion per month. As Bangladesh's 12 months moving average export is US$ 3.0 t0 3.5 billion. It is suggested the threshold of ≤3.5 billion per month exports value.

Figure 8: Monthly Export Trend (FOB)



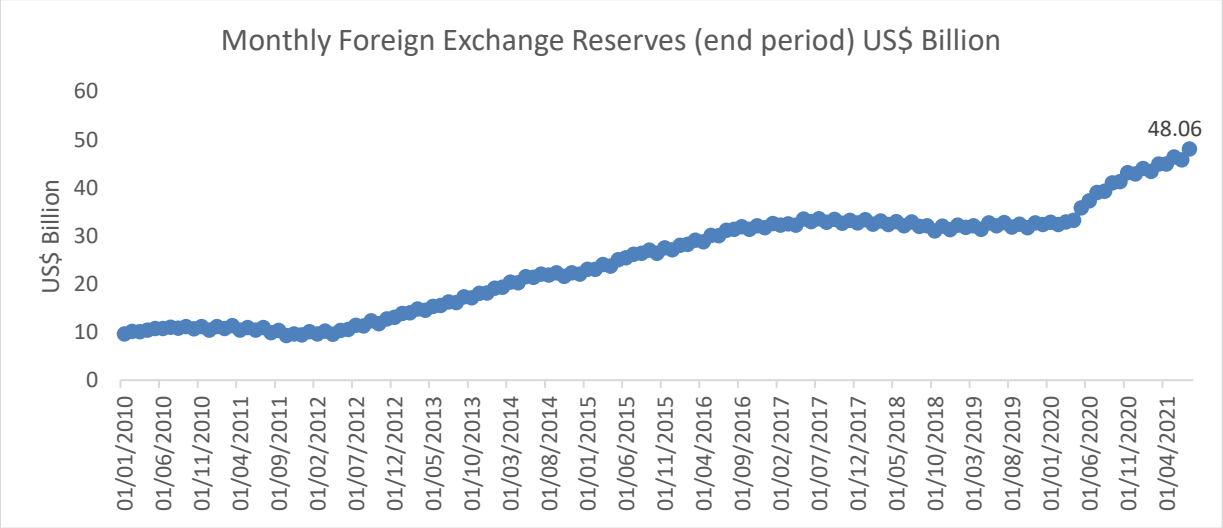
Source: Export Promotion Bureau (EPB), Accessed on 4 Oct 2021

[9] Bangladesh TCdata360, World Bank; https://tcdata360.worldbank.org/countries/BGD?indicator=1541&countries=BRA&viz=line_chart&years=1970,2019&country=BGD

9. Foreign Exchange Reserve:

- **Justification:** A robust foreign reserve is a critical macroeconomic indicator that indicates the financial strength of balance of payment and a country's positive image. It's also essential to get a healthy financial rating by the international rating agencies, which allows lower interest rates on borrowing from the global financial market.
- **Frequency**: Monthly
- **Measurement**: US$ Billion
- **Source**: Bangladesh Bank
- **Threshold**: If reserve falls to less than six months import value which is about US$ 30 billion in 2020.

Figure 9: Monthly Foreign Exchange Reserves (end period) US$ Billion

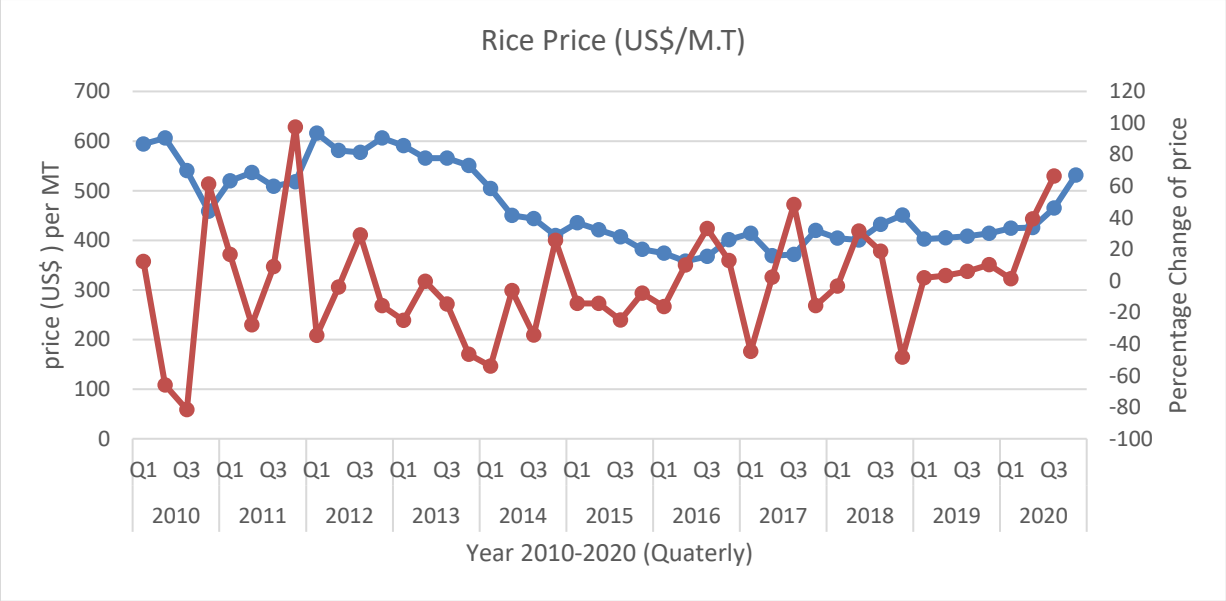


Source: Bangladesh Bank Monthly Economic Trend Sept 2021, Accessed on 4 Oct 2021

10. Rice Price:

- **Justification:** Rice is the staple food, and people heavily depend on rice for their life and livelihood in Bangladesh. Rice price increase has a tremendous socio-economic impact on society. Recently rice prices increased about 66 percent in the fourth quarter of 2020.
- **Frequency**: Quarterly
- **Measurement**: Percentage Change
- **Source**: Bangladesh Bank
- **Threshold**: ≥10 % increase monthly. Rice price has increased in a wide range. In this regard, ≥10 % increase is suggested for the quarterly threshold.

Figure 10: Rice Price (US$/M. T) and percentage change (quarterly)



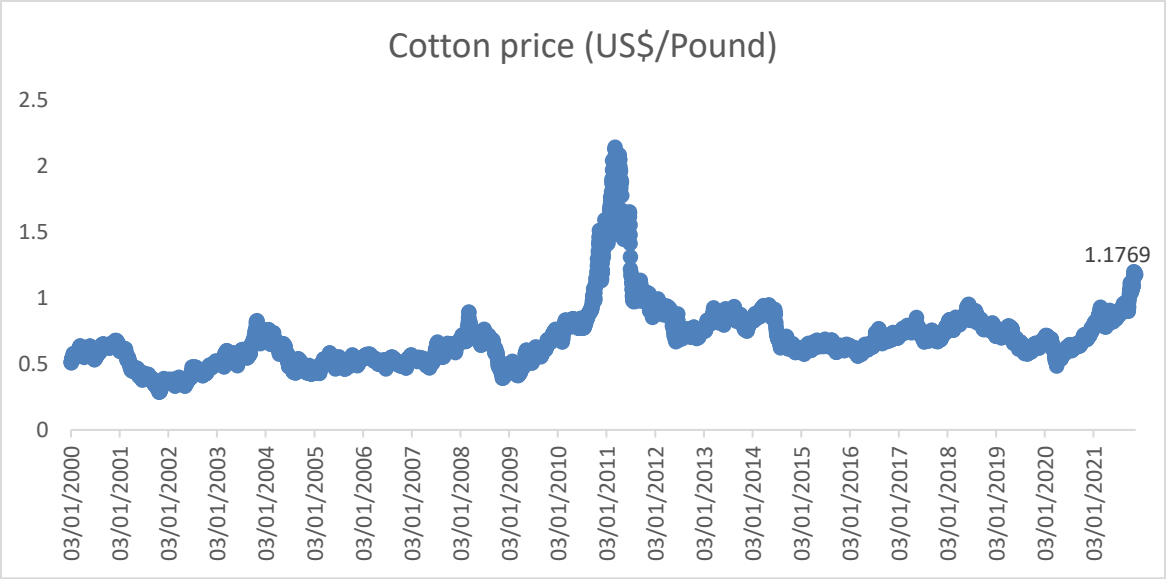
Source: Bangladesh Bank Quarterly Economic Trend (various issue), Accessed on 4 Oct 2021

11. Cotton price:

- **Justification:** Bangladesh's main export item is the readymade garment which requires huge cotton. Bangladesh's top import item is cotton which about US$ 6.5 billion in 2020. An increase in cotton price significantly impacts its RMG exports as production costs increase due to higher cotton prices.

- **Frequency**: weekly/daily
- **Measurement**: US$
- **Source**: Bangladesh Bank
- **Threshold**: ≥5 % price increase weekly/daily. Cotton price has increased over the years. In this regard, ≥5 % is suggested for the weekly threshold.

Figure 11: Daily Cotton price (US/Pound)



Source: macrotrends: https://www.macrotrends.net/2533/cotton-prices-historical-chart-data

12. Number of confirmed COVID-19 cases

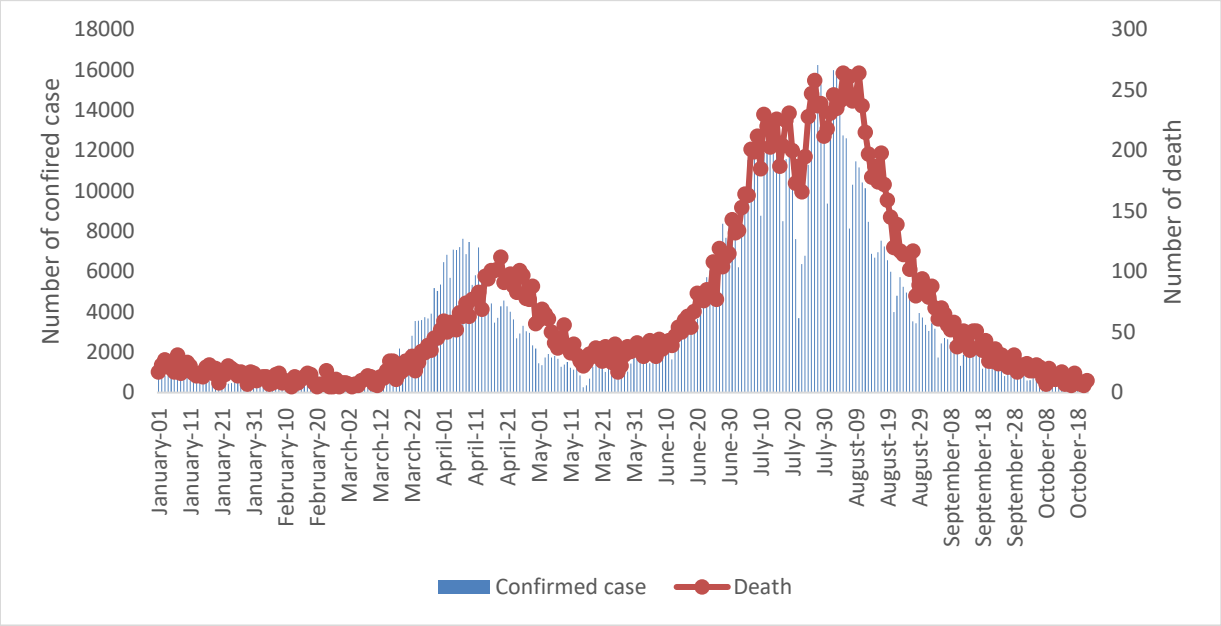
- **Justification:** With the COVID-19 pandemic, the lives and livelihood of people have been affected in an unprecedented manner. Total COVID positive cases in Bangladesh is over 1.5 million as of 7 October 2021 and the death toll exceeds 27000. Bangladesh began rolling out the COVID-19 vaccine in January 2021 and since then only about 40 million double doses have been administered which is about 20 percent of total population of the country.[10] Bangladesh's target is to fully inoculate about 118 million

[10] Directorate General of Health Services, Ministry of Health and Family Welfare, Government of People's Republic of Bangladesh; http://dashboard.dghs.gov.bd/webportal/pages/covid19.php

people of its total population (18+ people) requires 238 million doses of vaccines and is a daunting task [11] which requires an all-out effort by the government.

- **Frequency**: Weekly
- **Measurement**: Number of confirmed cases.
- **Source**: Director General of Health Service, Ministry of Health
- **Threshold**: More than 1000 confirmed cases per week. Figure 12 shows that about 1000 new positive cases every week. The threshold is established based on recent data trends.

Figure 12: Weekly Trend of Covid Case



Source: Director General of Health Service (DGHS), Accessed on 7 October 2021. 103.247.238.92/webportal/pages/covid19.php

13. Floods & Cyclones

- **Justification:** Bangladesh is a natural disaster-prone county and is extremely vulnerable to frequent monsoons, floods, cyclones, and storms surges. Bangladesh faces about ten different natural disasters every year (Table 2). Bangladesh also faces at least two major

[11] 103.247.238.92/webportal/pages/covid19-vaccination-update.php

floods and two major cyclones every year, which destroy coastal people's lives and livelihoods, which is 20 percent of Bangladesh territory under 19 districts.

- **Frequency**: Yearly/Adhoc
- **Measurement**: Number of disasters.
- **Source**: *Compilation from EM-DAT, CRED/UCLouvain, Brussels, www.emdat.be*
- **Threshold**: ≥ 100000, Table 2 shows that about 4 million people are affected by floods every year, while cyclones affect about 1.1 million people, two major devastating natural disasters in Bangladesh (Table 2). In this regard, 100000 is suggested for the threshold.

Table 2: Composition of main disasters over the years in Bangladesh (Flood and Cyclone)

	Flood	No of people Affected	Cyclone/Tornado	No of people Affected
2000	3	2679198	5	75599
2001	2	700000	4	28150
2002	1	1500000	2	100400
2003	2	550000	2	400
2004	3	36871700	2	17050
2005	3	1150000	2	22000
2006	2	211775	4	17999
2007	2	13851440	2	8978766
2008	2	635640	2	400
2009	2	500000	2	3954550
2010	2	575000	2	257110
2011	1	1570559	0	0
2012	2	5398475	0	0
2013	0	0	2	1523664
2014	1	2800447	0	0
2015	2	1411901	1	2600000
2016	1	1900000	1	1203555
2017	1	86025	1	3300012
2018	2	14000	0	0
2019	1	7600000	2	261551
2020	1	5448271	1	2600000
2021	1	268744	1	1300000
Average	1.7	3896508	1.7	1192782

Source: Compilation from EM-DAT, CRED/UCLouvain, Brussels, www.emdat.be Accessed on 15 September 2021

14. Man-made disaster (ferry accidents and fires in the factories)

- **Justification:** Many man-made/induced disasters are also frequent in Bangladesh, including factory fires and ferry accidents. Table 3 shows the composition of different disasters over the years. Bangladesh has about 700 rivers, and ferry accidents are frequent due to limited safety and monitoring systems. Bangladesh has faced at least three massive ferry accidents every year, which killed hundreds of people. Massive fires in factories are also frequent owing to compromised safety standards adhered to.
- **Frequency**: Yearly/Adhoc
- **Measurement**: Number of disasters.
- **Source**: *Compilation from EM-DAT, CRED/UCLouvain, Brussels, www.emdat.be*
- **Threshold**: ≥ 5, Bangladesh faces about ten different natural disasters every year.

Table 3: Composition of disasters over the years in Bangladesh

	Ferry accident	Factory Fire	Viral disease
2000	5	2	2
2001	3	1	0
2002	2	1	1
2003	6	0	0
2004	6	0	2
2005	8	2	0
2006	1	3	0
2007	0	1	2
2008	1	0	0
2009	4	0	0
2010	2	3	0
2011	1	0	0
2012	3	2	0
2013	1	1	0
2014	3	0	0
2015	2	1	0
2016	2	1	0
2017	3	1	1
2018	0	0	0
2019	1	4	0
2020	1	1	1
2021	4	3	1
Average	2.7	1.2	0.4

Source: Compilation from EM-DAT, CRED/UCLouvain, Brussels, www.emdat.be Accessed on 15 September 2021

15. Air quality

- **Justification**: According to World Air Pollution Report, Bangladesh is the most air polluted country in the world, and Dhaka is the second worst polluted city (Table 4).
- **Frequency**: Daily
- **Measurement**: Air Quality Index
- **Source**: https://www.iqair.com/laos.
- **Threshold**: Air Quality Index is not more 101 (healthy level is 1-100) or PM2.5 concentrations not more than 35.4 µg/m³

Table 4: Live Air Quality (daily)

Rank	Most Polluted countries	Country Score	Most Polluted Cities
1	Bangladesh	77.1	Delhi, India
2	Pakistan	59	Dhaka, Bangladesh
3	India	51.9	Ulaanbaatar, Mongolia
4	Mongolia	46.6	Kabul, Afghanistan
5	Afghanistan	46.5	Doha, Qatar
6	Oman	44.4	Bishkek, Kyrgyzstan
7	Qatar	44.3	Sarajevo, Bosnia & Herzegovina
8	Kyrgyzstan	43.5	Manama, Bahrain
9	Indonesia	40.7	Jakarta, Indonesia
10	Bosnia Herzegovina	40.6	Kathmandu, Nepal

Source: https://www.iqair.com/world-most-polluted-countries, Accessed on 30 October 2021

Conclusions

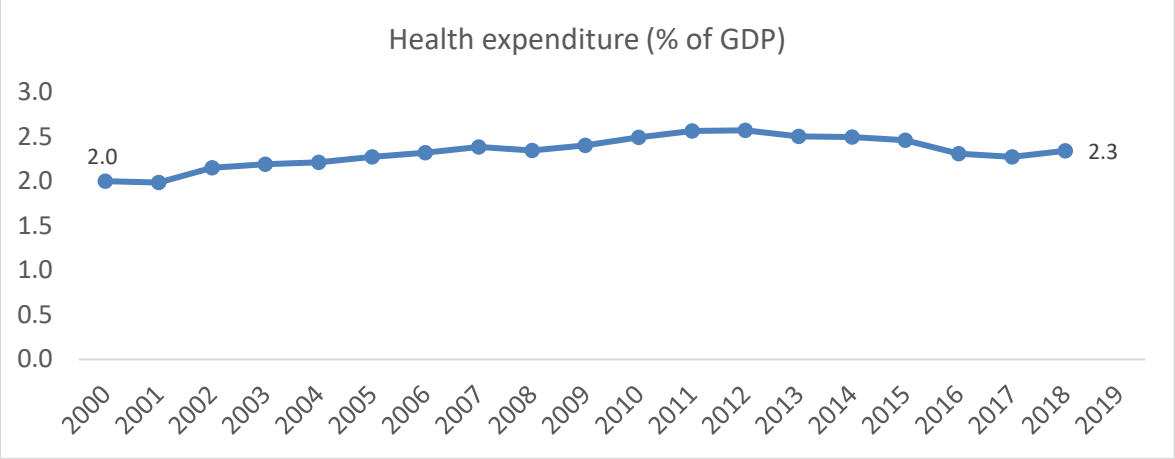
This study explores potential indicators that need to be monitored to track the developmental progress of Bangladesh and identify the potential risks that could disrupt Bangladesh's growth. Most of the monthly and quarterly data are presented collecting from different publicly available government sources. A threshold level for each indicator is suggested to monitor the risk as well as development progress. Bangladesh has made significant progress in its socio-economic development over the decades, led by the export and foreign workers' remittance inflow. The economy has also undergone a substantial structural change over the years. While the economy is growing, the main challenge is the lack of export diversification, both in products and markets. Also, COVID-19 has significantly impaired overseas employment, which may substantially impact the current account balance. The pandemic has also affected people's health, livelihoods, and employment, especially in the vast informal sector. Thus, low productivity, informal labour market, workplace safety, controlling disease outbreaks, and dealing with seasonal floods and cyclones are critical issues the country has to tackle to ensure sustained long-term economic growth.

Appendix 1. Additional Potential Indicators (Yearly data)

A1. Health Sector Expenditure:

- **Justification:** Bangladesh's health sector has been neglected over the years. As a percentage of GDP, health sector expenditure is about two percent, which is the lowest among South Asian countries (WDI, 2021).
- **Frequency**: Yearly
- **Measurement**: % of GDP.
- **Source**: WDI
- **Threshold**: ≥ 4%, The average expenditure is about 4 to 5 percent most of the developing countries. In this regard, 4% of GDP is suggested for threshold expenditure on the health sector.

Figure A1. Current health expenditure (% of GDP)



Source: World Development Indicators, 2021 (WDI), World Bank

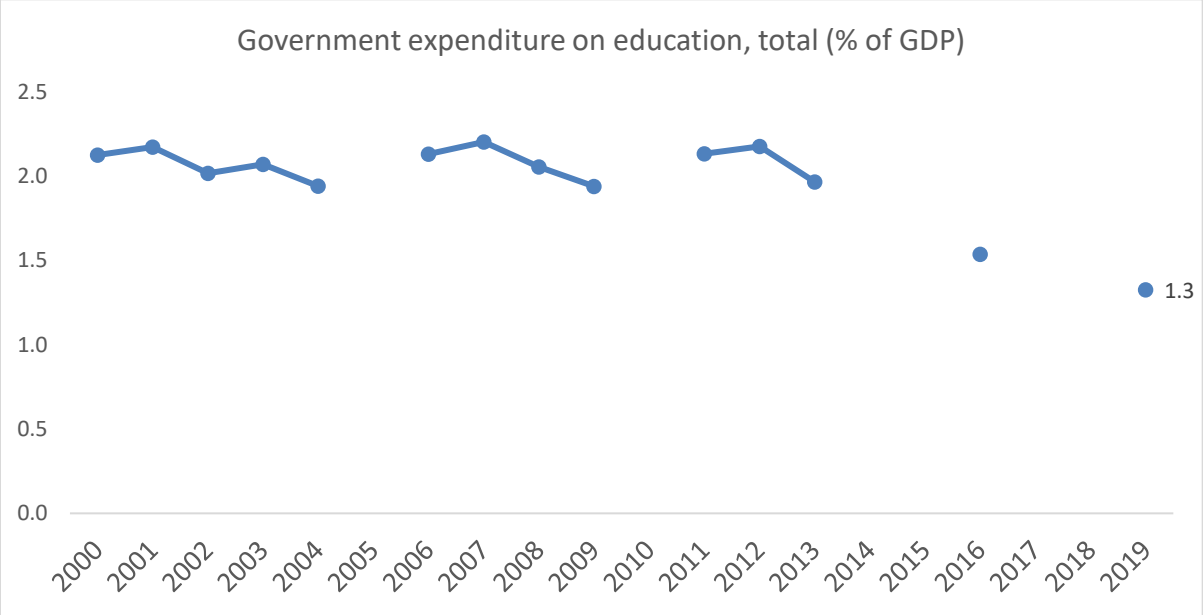
A2. Expenditure on Education

- **Justification:** Public expenditure in education as a percentage of GDP has decreased over the years in Bangladesh. Bangladesh's average schooling years have increased at a languid pace, about six years in 2019. The adult literacy rate is at 74 percent, which is much lower

compared to its South Asian neighbours (Human Development Index, UNDP, 2021) and hence shows potential for improvement.[12]

- **Frequency**: Yearly
- **Measurement**: % of GDP.
- **Source**: WDI
- **Threshold**: ≥ 4%, Bangladesh's expenditure in the education sector is about 1.3 percent of GDP while, India spends about 3.8 percent and Vietnam spends about 4.1 percent. (WDI, 2021). In this regard, 4% of GDP is suggested for threshold expenditure on the education sector.

Figure A2: Government expenditure on education, total (% of GDP)



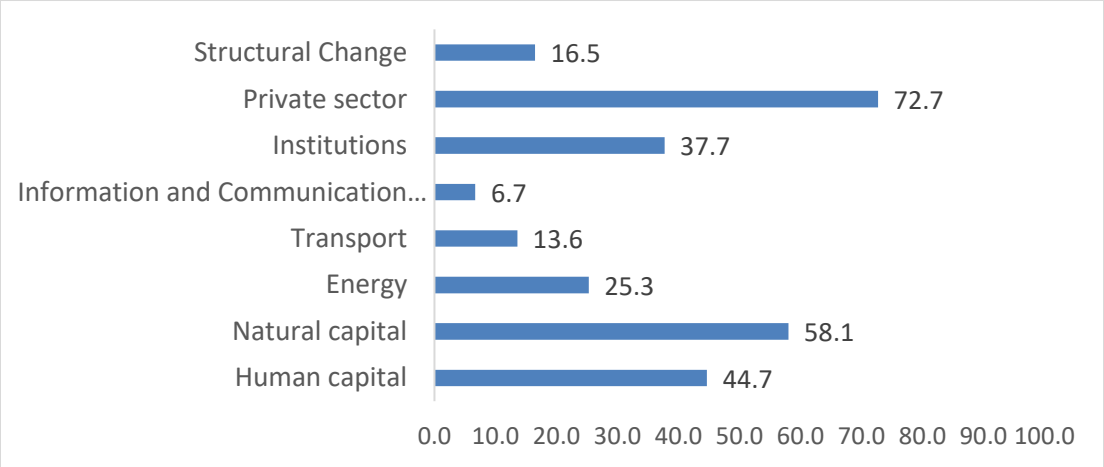
Source: World Development Indicators, 2021 (WDI), World Bank

[12] Human Development Reports, United Nations Development Program, 2020; http://hdr.undp.org/en/countries

A3. Productive Capacities Index (PCI)[13]

- **Justification:** The UNCTAD's productive capacities index (PCI) indicates the key drivers and enabling factors that foster productive capacities of a country.[14] The PCI is composed of 46 indicators across eight categories of productive capacities: natural capital, human capital, energy, ICTs, transport, private sector, institutions, and structural change. Although the PCI for Bangladesh has increased gradually over the years, it is still much lower compared to its competitors like Vietnam and India (UNCTAD, 2021). The sectoral productivity index shows that Information and Communication Technology (ICT), energy and transport sectors have the lowest productive capacities, while the private sector has made significant improvements in productive capacity in Bangladesh (Figure A3)
- **Frequency**: Yearly
- **Measurement**: Index.
- **Source**: Productive Capacities Index, UNCTAD; https://pci.unctad.org
- **Threshold**: ≥31. Bangladesh index is 26 where, Vietnam is 31.7 and India is 30. Bangladesh threshold index is suggested 31 same as Vietnam.

Figure A3: Sectoral PCI of Bangladesh in 2018



Source: UNCATD PCI (2021). Accessed on 7 October 2021, https://unctad.org/topic/least-developed-countries/productive-capacities-index

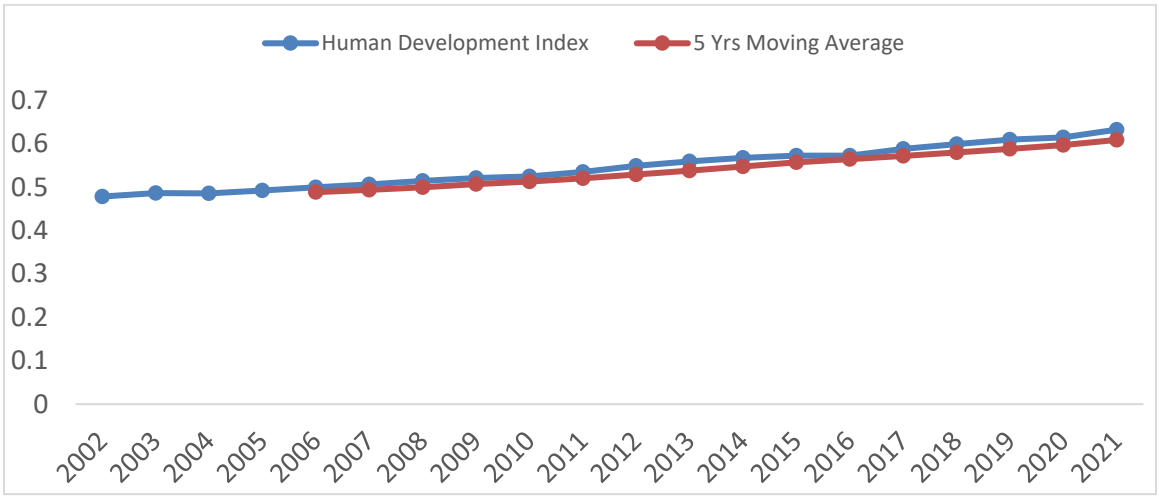
[13] The PCI defines by *UNCTAD (2021) that "productive capacities are the productive resources, entrepreneurial capabilities and production linkages that together determine a country's ability to produce goods and services that will help it grow and develop".*

[14] Productive Capacities Index, UNCTAD; https://pci.unctad.org

A4. Human Development Index (HDI)

- **Justification:** The human development index (HDI) shows how a country performs on its socio-economic development front. Bangladesh has made steady progress in human development relating to education, women and children, social welfare, etc. According to the UNDP's "Human Development Report-2020" Bangladesh's HDI rank was 133. However, among South Asian countries Sri Lanka (72), Maldives (79) India (131) and Bhutan (129) are ahead of Bangladesh which shows there is huge scope for improvement. Over the years, quality of education and financing to the health sector which are crucial HDI indicators have not been given proper focus in Bangladesh and expenditure on them as a percentage of GDP is lowest among South Asian countries (WDI, 2021). The informal labour market is another major concern that leads to lower productivity in the economy.
- **Frequency**: Yearly
- **Measurement**: Index.
- **Source:** UNDP
- **Threshold**: ≤0.7, The South Asian Average Index is 0.7 which index is suggested for the threshold.

Figure A4. Human Development Index (HDI)

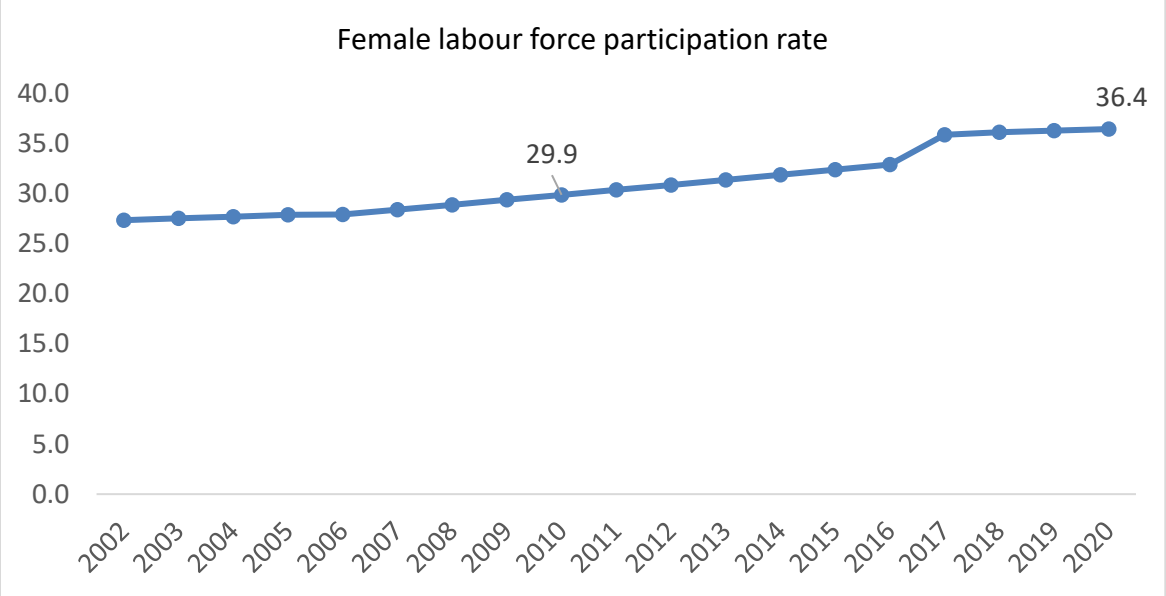


Source: UNDP

A5. Female Labour Force Participation

- **Justification:** Bangladesh has to a long way to go to achieve gender equality and women empowerment. As of February 2021, only 21 percent of seats in parliament were held by women in Bangladesh (UNWOMEN 2021).[15] Although female labour participation has increased, it is still much lower compared to its neighbours. Still, 63 percent of females are out of the formal labour market in Bangladesh as of 2020.
- **Frequency**: Yearly
- **Measurement**: % rate
- *Source:* WDI
- **Threshold**: ≤50%, The South Asian Average is 50% which rate is suggested for the threshold

Figure A5: Female labour force participation rate



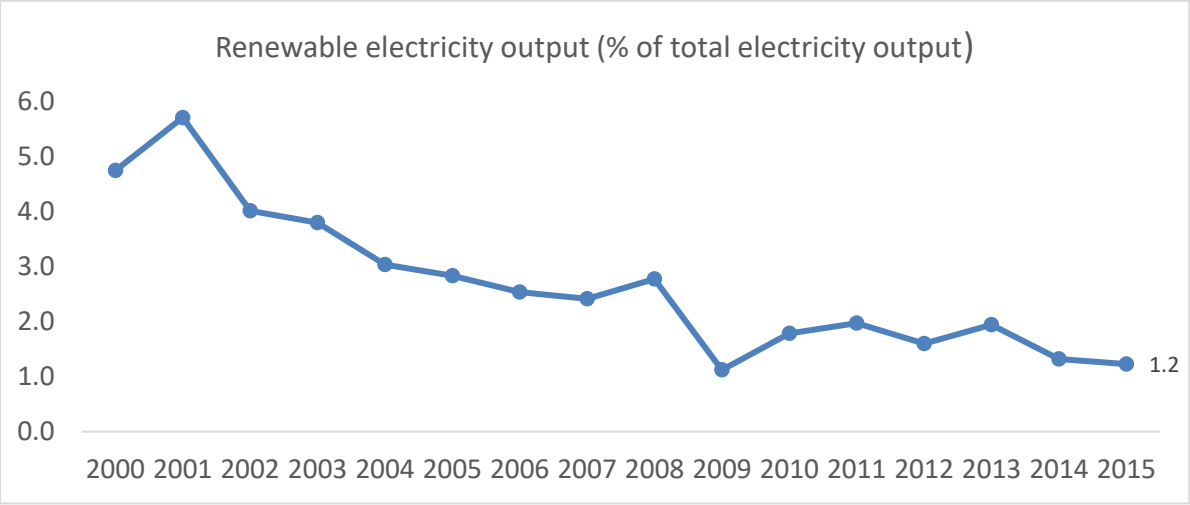
Source: World Development Indicators, 2021 (WDI), World Bank

[15] "Bangladesh: COVID-19 and gender monitor", UNWOMEN, 26 Jun 2020; https://data.unwomen.org/resources/covid-19-and-gender-monitor

A6. Renewable Electricity Output

- **Justification:** Environmental degradation is a crucial challenge for Bangladesh in attaining its sustainable development goals. Air pollution is increasing with rapid urbanisation and industrialisation A rise in sea-level is also a major threat to the lives and livelihoods of people in the coastal belt of Bangladesh. The main source of power generation is natural gas and fossil fuel. The renewable energy output as a percentage of total electricity has been meagre and declining over the two decades in Bangladesh (Figure A6). Renewable energy per capita is extremely low in Bangladesh. The various sources of power generation in Bangladesh includes natural gas (52 percent), furnace fuel (27.5 percent), diesel (6 percent), Import (5 percent), Coal (8 percent), Hydro and renewable energy generation (1.5 percent) (Power Division, *Ministry* of *Power*, *Energy* & Mineral Resources, 2021). Given the low share of renewables, Bangladesh is faced with a huge challenge to tackle the energy problem which is essential for long term sustained growth.
- **Frequency**: Yearly
- **Measurement**: % rate
- *Source:* Power Division, *Ministry* of *Power*, *Energy* & Mineral Resources
- **Threshold**: ≤10%, Bangladesh targets 10 % electricity from renewable energy by 2030 (Renewable Energy Policy in Bangladesh)

Figure A6. Renewable Electricity Output (% of total electricity output)

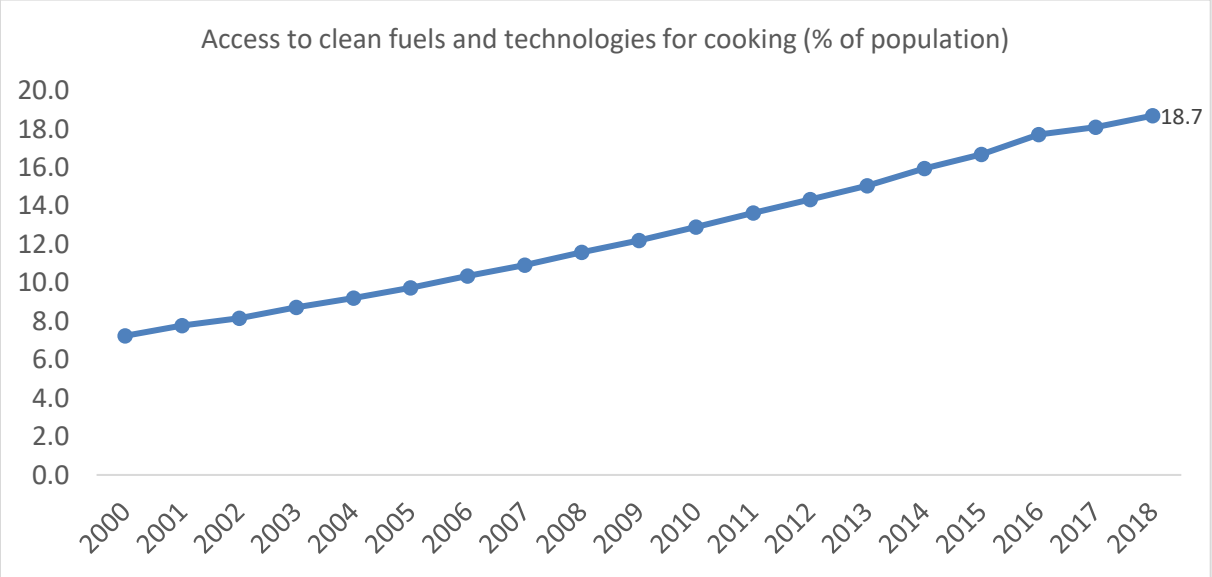


Source: World Development Indicators, 2021 (WDI), World Bank

A7. Access to Clean fuel and Technologies for Cooking:

- **Justification** Access to clean fuel and technologies is one of the major mandates of SDGs (Goal 7). Bangladesh has made some incremental progress over the two decades in accessing clean fuel for cooking. However still, 81 percent of the population, which is about 134 million people, has no access to clean fuel and technologies for cooking (Figure A7). Although Bangladesh has huge natural gas reserves, it is not distributed in most cities. Rural Bangladesh uses wood fuel while most cities/towns use LNG gas, whose price has increased substantially recently. The gap in access to clean fuel and technologies highlights the need for a substantial governmental effort to close this gap.
- **Frequency**: Yearly
- **Measurement**: % rate
- *Source: International Energy Agency (IEA) database. Accessed on 7 October 2021.* *https://www.iea.org/reports/sdg7-data-and-projections/access-to-clean-cooking*
- **Threshold**: ≤50%, Developing countries average is 50% which rate is suggested for the threshold

Figure A7. Access to clean fuels and technologies for cooking (% of population)



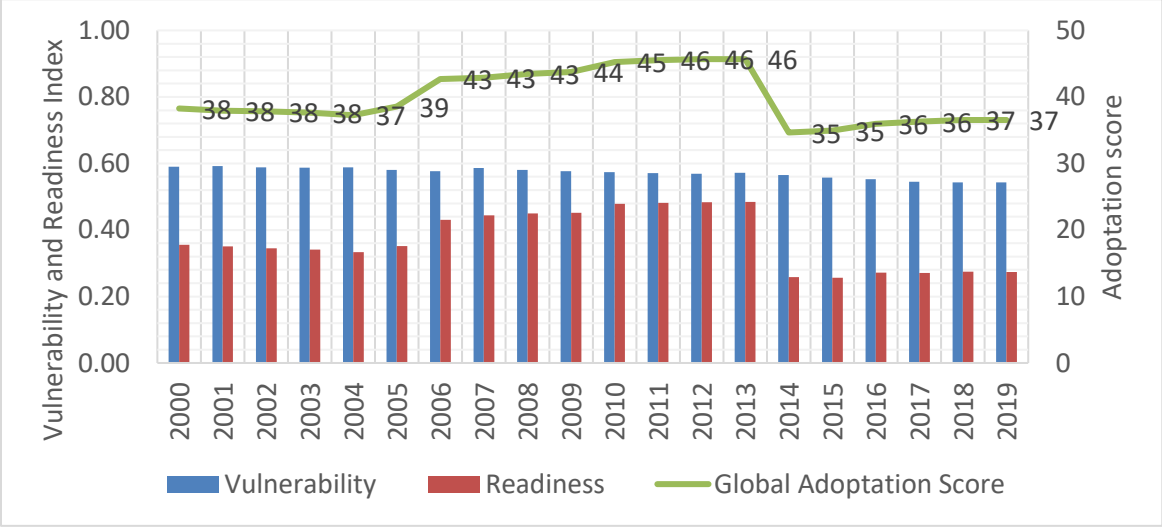
Source: International Energy Agency (IEA) database. Accessed on 7 October 2021.

https://www.iea.org/reports/sdg7-data-and-projections/access-to-clean-cooking

A8. Global Adoption Capacity

- **Justification:** The University of Notre Dame-Global Adaptation Index (ND-GAIN) presents a vulnerability index to climate disruptions. The Index captures a country's vulnerability to climate change and other global challenges as well as its readiness to improve resilience. The ND-GAIN brings together over 74 variables to form 45 core indicators to measure the vulnerability and readiness of 182 countries. A high adaptation score (0-100) means lower vulnerability. Bangladesh has a score of 36.5 in 2019, which is the 26th most vulnerable country and the 22nd least ready adaptation country (Figure A8). The high vulnerability score (0.543) and low readiness score (0.274) of Bangladesh gives it a score of 36.5 making it one of the high risk and low adaptation capacity countries, with a rank of 164 out of 182 countries in 2019. Thus, Bangladesh requires enormous investments and high-level innovations to improve its readiness, and this requires urgent action.
- **Frequency**: Yearly/Adhoc
- **Measurement**: Index.
- *Source: ND-GAIN, https://gain.nd.edu/our-work/country-index/rankings/*
- **Threshold**: ≤45, The average index of developing countries is 45 which index is suggested for the threshold.

Figure A8: Global Adaptation Index



Source: The University of Notre Dame-Global Adaptation Index (ND-GAIN),

https://gain.nd.edu/our-work/country-index/rankings/

DEPARTMENT OF
ECONOMIC AND
SOCIAL AFFAIRS

Bhutan

Report of the DESA project, "Establishing crisis response process in the LDC monitoring framework for graduating and graduated countries"

November 2021

This report was prepared under the capacity development activities of the Development Policy Branch (DPB), Economic Analysis and Policy Division (EAPD), United Nations Department of Economic and Social Affairs (DESA). The Project is funded by the Regular Progamme of Technical Cooperation. Inputs from the project consultant Mr. Tandin Wangchuk are gratefully acknowledged.
For more information, please contact Namsuk Kim, EAPD/DESA (kimnamsuk@un.org). The content, findings, interpretations and conclusions as expressed in this report do not necessarily represent the views of the United Nations or the Government of XXX.

Table 1 lists the suggested indicators for crisis monitoring.

Table 1.

Category		Name	Frequency	Measurement	Source	Threshold
1. Macroeconomic	1.1	Headline Inflation in India	Monthly	Percentage	https://www.mospi.gov.in/ Visit Ministry of Statistics and Programme Implementation (MOSPI) of India and Click CPI icon (RHS) which takes to separate internal web, a primary source of CPI for India.	Current threshold - 4% (+/-2)
	1.2	Number of Tourist arrival	Quarterly	Number	TCB administrative data. Alternatively, Monthly Statistical Bulletin, RMA can be considered but captures only dollar paying tourists.	At least 100,000[1]
	1.3	Non-performing loans to total gross loans	Quarterly	Percentage	Quarterly Financial Sector Review Report, RMA. https://www.rma.org.bt/RMA%20Publication/FSP/Financial%20Sector%20Performance%20June%202021.pdf	5%
2. Health and other emergencies	2.1	Number of new confirmed cases of Covid-19	Weekly	Number	Government portal for Covid-19, MoH. https://www.gov.bt/covid19/	0
	2.2	Number of new cases at Entry Points (by air & land)	Weekly	Number	Government portal for Covid-19, MoH	
	2.3	Occurrence of notifiable disease or syndrome.	Weekly	Type of case	NEWARS system of RCDC, MoH	

3. **Natural Disasters**	3.1	Average maximum and minimum temperature at the PDGL stations. The indicator may change to "Number of days above and below normal temperature"	Monthly	Degree Celsius	National center for Hydrology and Meteorology (NCHM)	There are some technical challenges in setting the threshold here mainly because of the need to define/establish normal temperature. NCHM is working on this specific issue and needs some time. To be discussed.
	3.2	Rainfall in the PDGL areas (mm) The indicator may change to "Number of days above and below normal rainfall"	Weekly	Millimeter	National center for Hydrology and Meteorology (NCHM)	Same issue as above
	3.3	Water level in the identified potentially dangerous glacial lakes (m) and EWS stations	Weekly	Meters	National center for Hydrology and Meteorology (NCHM)	Thorhtormi Lake: 7.5m Baytsho: 7.4m Rabstreng lake :7.4m Thanza water level:7.7m Tarina-Wahcey Water level:8.5m Dangsa water level: 5.35m Taktsemakha Water level:7.5 Tashithang water level: 9m Yebesa water level:3.3m Lugye lake:7.8m

1. Indicators for Macroeconomic situation

1.1 Headline Inflation in India

Rationale for use: Since over 80% of Bhutan's imports come from India and Bhutanese Ngultrum (Nu) is pegged to the Indian Rupee (INR), Bhutan's inflation rate co-moves with that of India with a time lag. The time lag between Bhutan's CPI and India's Wholesale Price Index (WPI) as estimated by the World Bank in 2018 was 6 months[2]. 'Headline Inflation' instead of 'core inflation' or 'food inflation' is proposed mainly in view of wide range of goods (example – food, construction materials, raw materials for industries, etc) imported by Bhutan and to maintain higher degree of freedom for further analysis should there occur abnormally high inflation in India in future.

1.2 No of Tourist arrivals

Rationale for use: Tourism plays significant role in Bhutan's economy in terms of its contribution to GDP, employment, government revenue and foreign exchange earnings. The current shock from Covid-19 faced by tourism industry and its ripple effects has shown how integral the industry is to other sectors of the economy, mainly the labor market and financial market – in the form of surge in unemployment and rising non-performing loans linked with hotel industries. Based on the enhanced level of productive capacity in the tourism industry seen recently through policy reforms and infrastructure investments, it is crucial for Bhutan to maintain the number of tourist arrivals at least at its carrying capacity.

Issues related to threshold: The Tourism Council of Bhutan (TCB) is in the process of assessing the national carrying capacity of tourism. Therefore, it will take some time to set a meaningful threshold. Alternatively, possibility of using the current occupancy capacity of hotels was explored to be used as proxy indicator.

Presently there are 309 hotels catering to tourists[3] consisting of hotels ranging from 3 star to 5 star category and certified Village Home stays. In total all these accommodation facilities provide 4,844 rooms offering 8,795 beds. Considering an average duration of 7 nights spent by a tourist in the country the present accommodation can host a carrying capacity of 457,340 tourists annually, i.e 114,335 quarterly. Even though, only around 70% of the carrying capacity was met in 2019, there are many hotels under construction, which means there will be increased capacity over the next few years. Therefore, it appears that at least 100,000 tourists may be necessary on a quarterly basis to sustain the tourism industry for now.

1.3 Non-performing loans to total gross loans

Rationale for use: Credit to housing continues to remain the highest in terms of its share of total loan portfolio with 27.4 percent in 2019/20. This is mainly on account of high demand for credit in residential and commercial housing, closely followed by service and tourism sector at 27.3 percent. Recently, the rise in non-performing loans has been a major concern in Bhutan. NPL

[2] Bhutan Development Update, World Bank, April 2021.
[3] Bhutan Tourism Monitor, 2019, Tourism Council of Bhutan.

increased by 23.7 percent in June 2020[4] from the preceding year and service and tourism sector and housing are the sectors reported with the highest NPL.

The absence of asset pricing or real estate pricing system makes it difficult to monitor the movement of asset prices, but anecdotal evidence suggests that the price of real estate, particularly land price is soaring in the country. Sudden collapse in the value of real estate may lead to further rise in NPL affecting the capital adequacy and liquidity position of the financial sector. It is therefore, important to monitor the NPL ratio. Ideally, asset price or real estate price index is the preferred indicator. In the absence of such index, the NPL can be used as the proxy indicator.

Data: The RMA publishes the data as part of their quarterly financial sector review report. The data, however, has minimum time lag of 3 months. The time series information can be shared by RMA.

2. Indicators for Health

2.1 Number of new confirmed cases of Covid-19

Rationale for use: The indicator is being tracked and it is important to continue to assess epidemiology, identify trends and intensity of epidemic, and direct operational decision and resources accordingly.

2.2 Number of new cases at Entry Points (by air & land)

Rationale for use: Covid-19 outbreak has spread across several borders. There are multiple entry points to Bhutan by air and land as Bhutan shares porous border with India. Most of the Covid-19 cases in Bhutan have been found to be cases 'imported' from other countries. It is important to closely monitor the epidemic developments in all entry points to enable decision on preventive measures.

Possible challenge: Collecting data for this indicator will warrant seamless access to international data and have to be collected through close cooperation with other countries. Alternatively, one can also consider monitoring '*number of cases in neighboring states of India'* as part of cross border risk prevention measure.

2.3 Occurrence of notifiable disease or syndrome collected by RCDC or NEWARS system

Rationale for use: The threat from emerging and re-emerging infectious diseases particularly zoonotic origin remain public health concern because of close interaction between human, domestic and wild animals. It is important to detect emergence or incursion of new diseases or

[4] Annual Report 2020, Royal Monetary Authority.

pathogens in time[5]. It is monitored through the Notifiable Disease Surveillance System (NDSS) of the Royal Centre for Disease Control (RCDC) of Ministry of Health.

The indicators for health are yet to be agreed with the Ministry of Health.

3. Indicators for Natural Disasters

Rationale for GLOF related Indicators: Bhutan has more than 700 glaciers and 2674 glacier lakes. Out of this, 17 lakes have been identified as potentially dangerous glacial lakes (PDGL) and poses high risks of Glacial lake Outburst Flood[6] (GLOF) threatening thousands of lives particularly in the western part of Bhutan. Due to the effects of climate change and global warming, glaciers in the Himalayas are found to be melting rapidly, thus exasperating the threat posed by GLOF. There have been instances of GLOF in the past taking away the lives and livelihoods. In addition, Bhutan's critical infrastructure along the river – roads and bridges and hydropower projects are susceptible to damage if GLOF occurs in future.

Against this backdrop, the following indicators are crucial to be monitored. The NCHM has already started to monitor the situation and collects data on frequent basis on some of the PDGLs.

3.1 Average maximum and minimum temperature at the PDGL stations – NCHM officials feel that this indicator cab be linked to melting of glaciers due to warming, forest fire risks and summer heat conditions in the southern part of the country.

3.2 Rainfall in the PDGL areas (mm) - NCHM officials feel that This indicator ca be linked to rainstorms, untimely rainfall, floods and landslides.

If the normal temperature and rainfall can be defined as indicated above, indicators 3.1 and 3.2 can be used to monitor disasters other than GLOF. Otherwise, monitoring will be limited to only GLOF which is highly dangerous and costly but less frequent compared to other disasters such as landslides and floods.

3.3 Water level in the identified potentially dangerous glacial lakes (m) and EWS stations
For the third indicator, there is no data on all PGDLs due to lack of infrastructure. Data is available for all lakes in Punatshangchhu basin where there are water level stations and lake monitoring stations installed. Considering its scale and potential threat downstream, monitoring Punatsangchhu basin is seen to be a good representation of the PDGLs at the moment. There are different thresholds for different lakes and different water level stations downstream.

[5] Revised NEWARS Guideline, National Disease Surveillance and Epidemiology Unit (NADSAE), Royal Centre for Disease Control, 2018.
[6] Report on the Rapid Assessment of Thorthormi Lake and the restoration of automatic water level sensors for the GLOF Early Warning System, National Center for Hydrology and Meteorology, Royal Government of Bhutan, 2019.

Earthquake: Geo-physically, Bhutan is located in one of the most seismically active zones in the world. Bhutan has witnessed several earthquakes of varied magnitude causing damages to lives and assets. The most recent earthquakes Bhutan experienced are two subsequent earthquakes in 2009 of magnitude 6.1 on the Richter scale and 2011 of magnitude 6.9 on the Richter scale. While no similar magnitudes of the earthquake have been recorded since then, Bhutan has been experiencing frequent low-intensity small-scale tremors. In addition, Bhutan is exposed to a range of weather and water-induced disasters, including landslides, Glacial Lake Outburst Floods (GLOF), flash floods, cloud bursts, and windstorms.

However, unlike GLOF, it is not possible to identify a leading indicator as there seems to be no way of assessing potential triggers to support early warning and preventive measures. This was confirmed by an official of the Department of Disaster Management.

Annex 1. list and contacts of Government counterparts

1. Mr. Tshering Wangchuk, Department of Disaster Management
2. Mr. Ugyen Chophel, National Centre for Hydrology and Meteorology (NCHM)
3. Mr. Tshering Dhendup, Ministry of Health
4. Ms. Tashi Choden, Gross National Happiness Commission (GNHC)

COUNTRY SPECIFIC REPORT

CRISIS MONITORING

INDICATORS & THRESHOLDS

FOR

Kiribati

Prepared for:

United Nations Department of Economic and Social Affairs

Draft Report

25 November 2021

Kiribati Country Profile

Kiribati is a south Pacific nation whose geography is characterized by small land masses formed on low lying atolls in the Pacific Ocean. Its land mass grouping consists of one coral island named, Banaba and 32 atolls of which the atoll called Tarawa has more than half the population of the country. Its total land size is 810.5 square km and it also features a total population size of 119,446[1]. It is presently categorized as a LDC and has been recommended for graduation pending ECOSOC decision deferred to 2024 (UN DESA, 2021).

The Kiribati economy is dependent on a fund from mining revenues of the past with additional support provided by remittances of emigrants and agricultural sales of coconut and fishing products. Fishing license also a major contributor to the economy. As a Small Island Developing States (SIDS) the economy is largely undiversified, with few natural resources and the key economic agents suffer from low productive capacities. The country is very susceptible to exogenous shocks from global economic crises, and it is also very vulnerable to the effects of climate change which has resulted in greater environmental hazards such as sea level rise, cyclones and floods.

There are no confirmed cases of COVID 19 in Kiribati and as of 19 November 2021, a total of 82,167 vaccines were administered to the population. As a pre-emptive measure, the World Bank has approved a loan of $2.5 million USD to improve health facilities to deal with COVID 19. Although there has not been a direct health impact the government of Kiribati has sort to strengthen food security using the UN COVID-19 Response and Recovery Multi-Partner Trust Fund of $150,000USD to improve local agriculture and fishing systems and bolster supply chain.

Environmental vulnerabilities such as cyclones and flooding are of major concern to Kiribati where category 5, cyclone Pam (2015) had caused severe flooding, damage to property and loss of life.

[1] World Bank, 2020

Table 1. EXISITING AND POTENTIAL INDICATORS FOR CRISIS MONITORING

Category		In. No.	Name of Indicator	Frequency	Measurement	Source	Threshold
Macroeconomic	Existing indicators		Gross national income (GNI) per capita			UN CDP https://www.un.org/development/desa/dpad/least-developed-country-category-kiribati.html	
			Human assets index (HAI) - Under-five mortality rate - Prevalence of stunting - Maternal Mortality Rate - Gross secondary school enrolment ratio - Adult literacy rate - Gender parity index for gross secondary school enrolment			UN CDP https://www.un.org/development/desa/dpad/least-developed-country-category-kiribati.html	

Category		In. No.	Name of Indicator	Frequency	Measurement	Source	Threshold
			Economic and environmental vulnerability index (EVI) - Share of agriculture, forestry and fishing in GDP - Remoteness and landlockedness - Merchandise export concentration - Instability of exports of goods and services - Share of population in low elevated coastal zones - Share of population living in drylands - Instability of agricultural production - Victims of disasters			UN CDP https://www.un.org/development/desa/dpad/least-developed-country-category-kiribati.html	
			Economic and Trade Indicators				
		1	Number of Visitor Arrivals	Monthly	% change over same period last year	Tourism Development	-100

Category		In. No.	Name of Indicator	Frequency	Measurement	Source	Threshold
						Department , Ministry of Information Culture and Tourism	
		2	Imports	Monthly	% change over same period last year	Pacific Data Hub https://stats.pacificdata.org/vis?lc=en&df[ds]=ds%3ASPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=M.KI.IMP.&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&fs[0]=Topic%2C0%7CMulti-domain%23XDO%23&fs[1]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency	-100%

Category		In. No.	Name of Indicator	Frequency	Measurement	Source	Threshold
		3	Exports	Monthly	% change over same period last year	Pacific Data Hub https://stats.pacificdata.org/vis?lc=en&df[ds]=ds%3ASPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=M.KI.EXP.&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&fs[0]=Topic%2C0%7CMulti-domain%23XDO%23&fs[1]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency	-100%
		4	Merchandise Export Growth	Monthly	(y-o-y, %)	ASIA REGIONAL INTEGRATION CENTER https://aric.adb.org/macroindicators	-85

Category		In. No.	Name of Indicator	Frequency	Measurement	Source	Threshold
		5	Exchange Rate, Local Currency per US$ (average)	Monthly	Dollar	ASIA REGIONAL INTEGRATION CENTER https://aric.adb.org/macroindicators	0.65
		6	Merchandise Import Growth (y-o-y, %)	Monthly	(y-o-y, %)	ASIA REGIONAL INTEGRATION CENTER https://aric.adb.org/macroindicators	-94%
			Environmental Indicators				
Environmental	Proposed indicators	7	Sea level	monthly	Precentage Meters rise	http://www.bom.gov.au/ntc/IDO70060/IDO70060SLD.shtml	2.8
		8	Sea surface temperature	monthly	Precentage change Degrees celcius	http://www.bom.gov.au/ntc/IDO70060/IDO70060WTD.shtml	30

Category		In. No.	Name of Indicator	Frequency	Measurement	Source	Threshold
		9	Coastal Flood	Ad hoc	No. of people affected	EM-DAT, the International Disaster Database https://public.emdat.be/data	300
			HEALTH INDICATORS				
Health and Other Emergencies	Proposed indicators						
		10	Cumulated number of cases of COVID-19	daily	units	Pacific Data Hub & the Pacific Community (SPC) Public Health Division	180

		11	Cumulated number of deaths due to COVID-19	monthly	unit	Pacific Data Hub & the Pacific Community (SPC) Public Health Division https://stats.pacificdata.org/vis?fs[0]=Pacific%20Island%20Countries%20and%20territories%2C0%7CTuvalu%23TV%23&fs[1]=Pacific%20Island%20Countries%20and%20territories%2C0%7CKiribati%23KI%23&fs[2]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency&df[ds]=ds%3ASPC2&df[id]=DF_COVID&df[ag]=SPC&df[vs]=1.0&pd=2020-03%2C&dq=M.TV%2BKI.DEATHS&ly[cl]=GEO_PICT&ly[rw]=TIME_PERIOD	180

Existing Indicators

The UN DESA website was used to attain the present background information of Kiribati concerning existing indicators and how the country measures up for graduation out of LDC status. Graduation from LDC status is annually monitored and determined with economic, social, and environmental indicators for a wholistic view of the country's advancement in those three areas for sustainable growth. The existing three broad indicators of development for Tuvalu are gross national income (GNI) per capita, human assets index (HAI) which include 3 indicators for the health index and 3 indicators for the education index; and economic and environmental vulnerability index (EVI) which include 4 indicators for the economic vulnerability index, and 4 indicators for the environmental vulnerability index.

In 2021, Kiribati recorded its GNI per capita of $3183 per capita, the HAI was 81.5, and EVI at 51.7, showing key indicators of GNI and HAI well above the graduation thresholds, in the case of GNI almost three times higher than the threshold.

LDCs Indicators	**Graduation Threshold**	**Kiribati (2021)**
GNI per capita	$1222	$3183
HAI	66 or above	81.5
EVI	32 or below	51.7

Crisis Monitoring Indicators

Although Kiribati meets the existing criteria in two key indicators for graduation from LDC status, this has yet to be done. From E/RES/2021/11 on 15 June 2021, the CDP after giving consideration to the vulnerabilities and developmental challenges of Kiribati for successful

movement out of LDC status, concluded to recall its decision for graduation of Kiribati out of LDC status by 2021 and instead due to the social and economic effects of COVID 19 pandemic have pushed the consideration to 2024. The EVI figure of 51.7 represents the great extent at which Kiribati is highly vulnerable to economic and environmental exogenic shocks from natural disasters such as drought, floods, and hurricanes and due to its reliance on aid from other countries is also at the mercy of the economic viability of these outside economies. The threats of COVID 19 coupled with the economic and environmental vulnerability of the nation has resulted in the deference of its graduation.

Macroeconomic

Based on the monitored indicators of GNI at $3183, Kiribati is about three times the threshold GNI for graduation and the nation also has a Human Asset Index of 81.5 which is significantly greater than the level for inclusion. Kiribati has the socioeconomic capacity for graduation out of the LDC category, but the vulnerabilities are a major cause of concern for the CDP. The low-lying nature of the nation which is noted to incur land loss due to sea level rise and the impacts of cyclone Pam (2015) resulting in loss of property and widespread damage of agricultural assets. The Kiribati economy is based on revenue from fishing, agriculture, and remittances from migrated Kiribatis abroad. The low productivity and high reliance on imported products also make Kiribati highly economically vulnerable.

Natural Disasters

The low-lying nature of Kiribati has made it highly susceptible to destruction from hurricanes and flooding, while saltwater incursion to its water table from sea level rise and flooding coupled with low rainfall increases the likelihood of drought. The effects of climate change with sea level rise have been a persistent threat to the livelihood of Kiribati with land lost and water levels rise pushing an already high-density population into a diminishing amount of land area. Based on the EVI, Kiribati is particularly vulnerable in share of population living in drylands value 4.6 (index 4.6) and share of population in low elevated coastal zones value 95.2 (index 100).

Health

Kiribati has no confirmed cases of COVID 19 infections among its 119,446 population. As of 19 November 2021, a total of **82,167** COVID 19 vaccination doses have been administered. The lack of cases of COVID 19 in Kiribati to this point is ideal as the eventual effects on the health and health care system has been devastating especially where Kiribati has a very limited number of hospital beds to support its population size. The degree of vaccination also provides some mitigation from the severity of the disease on individuals thus reducing the need for hospitalization.

Potential Indicators for Crisis Monitoring

The suggested indicators provided in Table 3 above have been attained sourced from a variety of international institutions with a large portion from the Pacific Data Hub. The included excel files include raw data of the indicators. Below is a list of potential indicators.

MACROECONOMIC INDICATORS

1. Imports

Justification:

The ability to import indicates the willingness to pay for goods not available locally or due to preferences for external goods. This is made possible by the country having sufficient foreign exchange to make inflows of trade possible. Imports for Tuvalu have been used as an indicator for the health of the economy considering the covid 19 pandemic, by looking for growth or contraction of importing based on a comparison with the previous year.

- Frequency: Monthly
- Measurement: % change over same period last year
- Source: Pacific Data Hub

- https://stats.pacificdata.org/vis?lc=en&df[ds]=ds%3ASPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=M.TV%2BKI.IMP.&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&ly[rw]=GEO_PICT&fs[0]=Topic%2C0%7CMulti-domain%23XDO%23&fs[1]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency
- Threshold: -100%

2. Exports

Justification: Exports from Kiribati are mainly fish and fish-based products and coconut oil. Exports show the ability of the country to earn foreign exchange

- Frequency: Monthly
- Measurement: % change over same period last year
- Source: Pacific Data Hub https://stats.pacificdata.org/vis?lc=en&df[ds]=ds%3ASPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=M.TV%2BKI.IMP%2BEXP.&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&ly[rw]=GEO_PICT&fs[0]=Topic%2C0%7CMulti-domain%23XDO%23&fs[1]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency
- Threshold: -100%

3. Number of Visitor Arrivals

Justification: The country of Kiribati has recognized the potential of their fledgling tourism sectors to increase the economic development of their countries. Although the contribution is very small in this time, it does have the potential for economic growth and become a more viable source of income for the country.

- **Frequency**: Monthly

- **Measurement**: percentage change over previous period
- **Source**: Pacific Data Hub https://stats.pacificdata.org/vis?lc=en&df[ds]=SPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=..VIS..&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&ly[rw]=GEO_PICT
- **Threshold**:
- -100%

4. Merchandise Export Growth

Justification: a critical area for economic growth is through export of goods locally produced. This indicator serves as a good measure of the progress or lack thereof of Kiribati by increasing the potential for earning foreign exchange by increasing potential market size.

- **Frequency**: Monthly
  Measurement: (y-o-y, %)

  Source: ASIA REGIONAL INTEGRATION CENTER

  https://aric.adb.org/macroindicators
- **Threshold**: -85

5. Exchange Rate, US$ per Local Currency (average)

Justification: Kiribati dollar is pegged to the Australian dollar in a 1:1 ratio. Changes in the exchange rate of the Australian dollar to the USD has a range of impacts on the local Kiribati economy. These impacts would include the ability and attractiveness to engage in merchandise trade with other nations; inflation is another outcome where based on the movement of the value determines whether more or less of that currency is needed to purchase commonly bought commodities. The exchange rate also has a bearing on economic growth throw

the effects on the trade balance through ability to import due to greater purchasing power and lower desire to purchase domestically.

- **Frequency**: Monthly
- **Measurement**: Kiribati dollar/ Australian dollar

  Source: ASIA REGIONAL INTEGRATION CENTER
  https://aric.adb.org/macroindicators
- **Threshold**: 0.65

6. Merchandise Import Growth (y-o-y, %)

Justification: Merchandise Imports are goods produced outside the country and are purchased and transported into the country. These goods add to the resources of the country and so increase the utility to the consumers of that country reducing on growth from the National Gross Product.

Frequency: Monthly

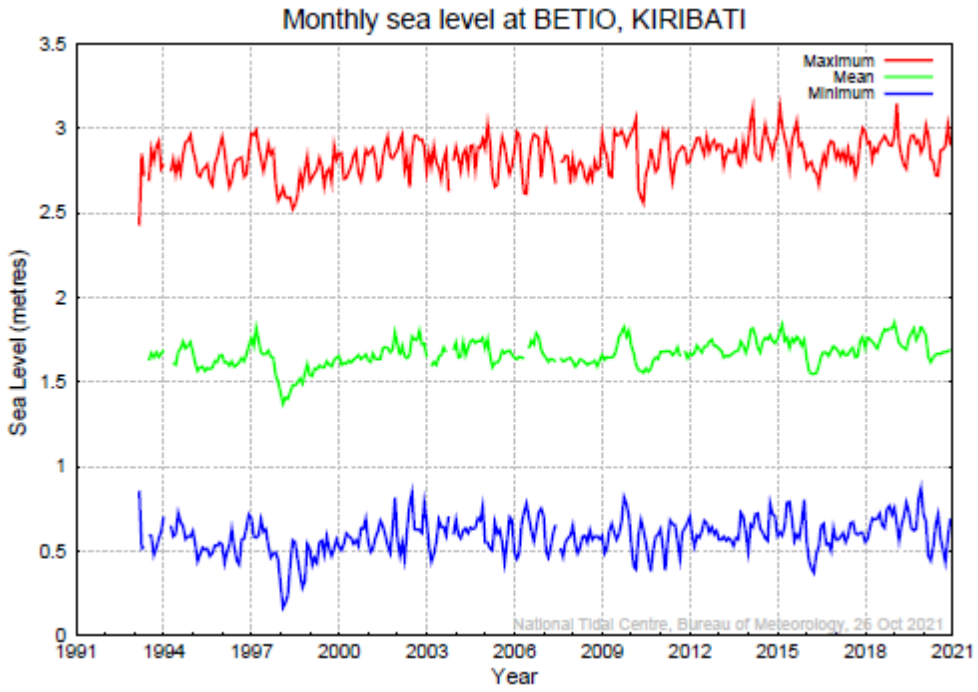
Measurement: (y-o-y, %)

Source: ASIA REGIONAL INTEGRATION CENTER
https://aric.adb.org/macroindicators

- **Threshold**:
  -94%

ENVIRONMENTAL INDICATORS

7. Sea level rise



http://www.bom.gov.au/ntc/IDO70060/IDO70060SLI.pdf

Justification: Kiribati consists of low-lying islands where rising sea level represents the inevitability of major losses and disaster for the country. The need to continuously monitor sea level is of paramount importance to determine when and at what rate mitigating actions are needed. The monitoring is based on the Pacific Sea Level and Geodetic Monitoring (PSLGM), which operates under the Climate and Oceans Support Program in the Pacific (COSPPac). It is a continuation of the 20-year South Pacific Sea Level and Climate Monitoring Project (SPSLCMP).

Frequency: monthly

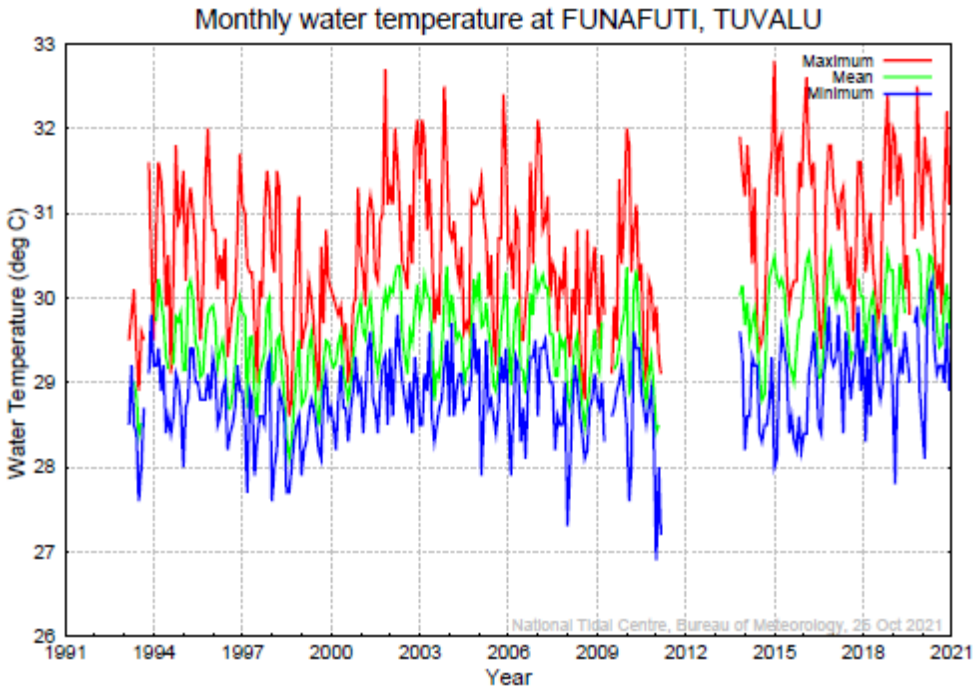
Measurement: meters

Source: Australian Government Bureau of Meterology.

http://www.bom.gov.au/ntc/IDO70060/IDO70060SLD.shtml (Kiribati)

Threshold: 2.8m

8. Sea surface temperature



http://www.bom.gov.au/ntc/IDO70056/IDO70056WTI.pdf

Justification: Kiribati consists of low-lying islands where oceanic activities including storms and other weather systems can greatly affect countries through storm surge and other effects of low-lying coastal areas. Temperature differences recorded at sea surface can give an indication of developing weather systems and possible impending disaster.

Frequency: monthly

Measurement: degrees Celsius ^{o}C

Source: Australian Government Bureau of Meteorology.

http://www.bom.gov.au/ntc/IDO70060/IDO70060SLD.shtml (Kiribati)

Threshold: 30 ^{o}C

9. Coastal Flood

Justification: Coastal flooding is a high probability to the low-lying nations of the Pacific region and result in damage to infrastructure and livelihoods. With climate change, SIDS are particularly vulnerable to these natural disasters, so must be prepared when they occur. With the damage produced, natural disasters play a significant role as an environmental hazard which may have long term effects on the developmental path of the country which is affected.

Frequency: Ad hoc

Measurement: No. of people affected

Source: EM-DAT, the International Disaster Database
https://public.emdat.be/data

Threshold: 300

HEALTH INDICATORS

10. Cumulated number of cases of COVID-19

Justification:

With the lack of presence of any cases of covid 19 in Kiribati, the current number of cumulated cases are at 0. Any infection occurring on these islands will be the start of a cumulated figure and the rate at which this figure increases will provide an idea of how the government will be able to deal with covid 19 outbreak in the country. The cumulative figure will also provide insight on effectiveness of protocols and education in the country and its possible impact on the healthcare sector. As of 2016, Kiribati had 1.9 hospital beds per 1000 persons[2].

[2] World Bank, 2021

Frequency: monthly

Measurement: units

Source: Pacific Data Hub & the Pacific Community (SPC) Public Health Division

https://stats.pacificdata.org/vis?lc=en&df[ds]=SPC2&df[id]=DF_COVID&df[ag]=SPC&df[vs]=1.0&dq=M.TV%2BKI.DEATHS&pd=2020-01%2C&ly[cl]=GEO_PICT&ly[rw]=TIME_PERIOD

Threshold: 180 cases.

11. Cumulated number of deaths of COVID-19

Justification:

Kiribati is one of the few countries which have so far been able to not have any incidence of the covid 19 disease in their countries. Once covid 19 becomes present by either an infected returning national or entering non-national then this has the potential to go from imported cases to community spread very easily and eventually producing the challenges on health care resources other small countries have endured. As with many other countries, covid 19 related deaths have occurred once the disease was introduced into the country.

Frequency: monthly

Measurement: units

Source: Pacific Data Hub & the Pacific Community (SPC) Public Health Division

Threshold: 180

DEPARTMENT OF
ECONOMIC AND
SOCIAL AFFAIRS

Lao PDR

Report of the DESA project, "Establishing crisis response process in the LDC monitoring framework for graduating and graduated countries"

17 November 2021

This report was prepared under the capacity development activities of the Development Policy Branch (DPB), Economic Analysis and Policy Division (EAPD), United Nations Department of Economic and Social Affairs (DESA). The Project is funded by the Regular Progamme of Technical Cooperation. Inputs from the project consultant Ms. Latsany Phakdisoth are gratefully acknowledged. For more information, please contact Namsuk Kim, EAPD/DESA (kimnamsuk@un.org). The content, findings, interpretations and conclusions as expressed in this report do not necessarily represent the views of the United Nations or the Government of Lao PDR.

Table 1 lists the suggested indicators for crisis monitoring. *Attached excel file includes data of the indicators for the past 20 years, if applicable.*

Category	In. No.	Name	Frequency	Measurement	Source	Threshold
Macroeconomic	1	Inflation rate	Monthly	Percentage change	Bank of Lao PDR	≥6%
Macroeconomic	2	Exchange rate Kip/USD	Daily	Kip to US dollar	Bank of Lao PDR	±5% monthly YOY fluctuation
Macroeconomic	3	Gap between Commercial Bank and Parallel market Rate –Kip/USD	Monthly	Gap in Percentage	Bank of Lao PDR	≥5% monthly gap
Macroeconomic	4	Foreign reserves	Monthly	US$ Million	Bank of Lao PDR	<US$1,300 mil.
Macroeconomic	5	Credit growth rate	Monthly	Percentage	Bank of Lao PDR	≤ zero monthly growth rate (YoY)
Macroeconomic	6	Non-performing loans to total gross loans ratio	Quarterly	Ratio	Bank of Lao PDR	≥5%
Disasters	7	Number of people killed and affected by a natural disaster	Ad hoc	Number of People affected	EM-DAT, CRED	> 40,000 ppl affected
Disasters	8	Number of Earthquakes	Ad hoc	Number of earthquakes	Lao National Earthquake Data Information Center	>10 time per month and / or when a 5.5 Richter strikes the country
Health	9	Air quality	Daily	AQI or PM 2.5 concentration	IQAir	AQI >100 or PM2.5 >35.4 µg/m³

Category	In. No.	Name	Frequency	Measurement	Source	Threshold
Health	10	Number of confirmed COVID-19 cases	Daily	Number of confirmed cases	Lao COVID-19 Task Force	>1,000 confirmed cases per day
Other emergencies	11	Number of deaths from road accidents	Monthly	Number of deaths	Traffic Police Department, Ministry of Public Security	>100 deaths per month
Other emergencies	12	Air traffic to Wattay International Air port	Daily	Percentage	Flightradar24	Percentage of tracked flights to scheduled flights is below 10%
Other emergencies	13	Number of Tourist Arrivals	Monthly	Monthly growth rate	Tourism Development Department, Ministry of Information Culture and Tourism	≤ -30% monthly growth rate.

[You can describe here details of the indicators, justification, thresholds, possible problems, possible use of the indicators, such as which ones would be the most important ones, if applicable]

1. Inflation rate

- **Justification**: Rising inflation rate increases living cost of the locals. Those with low incomes have been heavily impacted by the rising cost of living.
- **Frequency**: monthly
- **Measurement**: Percentage Change
- **Source**: Bank of Lao PDR(BOL) https://www.bol.gov.la/inflation
- **Threshold**: ≥6%. The average annual inflation from 2000 to 2020 is 6.6%. The 9th Five-Year National Socio-Economic Development Plan (NSEDP) (2021-2025) suggests that by 2025 annual inflation rate is equal to or smaller than 6%. In this regard, 6% is suggested for the monthly threshold.

2. Lao Kip-USD exchange rate

- **Justification**: The Lao kip/US dollar daily BOL reference rate reached Kip 10,175/US$1 on Oct 29, 2021, depreciating by 10 percent year-on-year compared to 2020 (Kip 9,239/$1

on Oct 29, 2020). Depreciation of Lao Kip may boost exports; however, as large portion of consumer goods are imported, this movement fuels inflation.

- **Frequency**: Daily
- **Measurement**: Kip/US dollar exchange rate
- **Source**: Bank of Lao PDR(BOL). https://www.bol.gov.la/en/referenceRate and author's calculation.
- **Threshold**: ±5% monthly fluctuation (YOY). The threshold is established based on recent monthly exchange rate fluctuation trends as well as the target set by the 9th NSEDP.

3. Gap between Commercial Bank and Parallel Market Rate –Kip/USD

- **Justification**: The gap between commercial bank and parallel market rate indicates the pressure of Lao Kip in the foreign exchange market, the bigger the gap the higher the pressure.
- **Frequency**: Monthly
- **Measurement**: Percentage
- **Source**: Bank of Lao PDR(BOL). https://www.bol.gov.la/exchang_rate_all and author's calculation.
- **Threshold**: ≥5%. The threshold is established based on recent data trend.

4. Foreign Reserves

- **Justification**:
  - Lao gross official reserves stood at US$873 million covered around 1.2 months of import in December 2018[1]. Since middle of 2020 the gross official service has improved and stood at about US$1.23 billion in August 2021[2].
  - The country total public and publicly guaranteed debt reached 72 percent of GDP in 2020. On average, US$1.3 billion of public external debt service (not including guarantees) are due each year during 2021-25, of which more than half are on commercial terms[3].
  - The high level of debt with a low level of reserves weakens the country capacity to mitigate external shocks.
- **Frequency**: Monthly
- **Measurement**: US$ Million
- **Source**: Bank of Lao PDR(BOL). https://www.bol.gov.la/External_Sectors
- **Threshold**: <US$1,300 million which is the annual average public external debt service.

[1] IMF, Lao PDR _2019 Article IV Consultation-Press release. August 2019

[2] Improvement of the gross official reserve was due to the Peoples Bank of China (PBOC) extended a 6 billion renminbi (equivalent to US$900 million) swap line to Bank ofLao PDR (BoL) in mid-2019 with a maturity of 3 years – World Bank – Lao PDR economic monitoring, August 2021.

[3] ibid.

5. Growth rate of commercial bank credit to private sector

- **Justification**: Due to the economic slowdown, the growth of commercial banks credit to private sector (YoY) declined. Lending to the private sector grew at an average of 3% in the first half of 2021, lower than the average of 8% in the same period in 2020. In May 2021, the growth rate hits the lowest point of 2.46%.
- **Frequency**: Monthly
- **Measurement**: Percentage
- **Source**: Bank of Lao PDR(BOL). https://www.bol.gov.la/Money_and_Banking and author's calculation.
- **Threshold**: ≤ zero monthly growth rate. The threshold is established based on recent data trend.

6. Non-performing loans to total gross loans ratio

- **Justification**: A sudden slowdown in economic activity due to COVID-19, could lead to higher non-performing loans and cause further decline in credit growth. The average quarterly non-for forming loans to total gross loans ratio between Q4-2017 and Q4 2020 is 3.11%, the ratio has slight decreased to 2.8% in Q2 2021.
- **Frequency**: Quarterly
- **Measurement**: ratio
- **Source**: Bank of Lao PDR(BOL). https://www.bol.gov.la/Money_and_Banking .
- **Threshold**: ≥3%. The 9th NSEDP has set the target for the ratio below or equal to 3% by 2025.

7. Number of people affected by natural disasters

- **Justification**: Lao PDR is vulnerable to floods, increase frequency and intensity of flood negatively affects agriculture sector which employs more than 60% of the population. Lao natural disaster data for the period of 2000 to 2021 from EM-DAT, CRED shows that floods affected a large population, followed by storms and epidemic as show in Table2: Natural disaster of Lao PDR (Jan 2000- Jun 2021)

Table 2: Natural disaster of Lao PDR (Jan 2000- Jun 2021)

Disaster Type	No. of events	Deaths	Affected
Flood	15	268	2,894,061
Storm	7	18	960,796
Epidemic	4	123	45,685
Drought	1		

Source: EM-DAT, CRED https://public.emdat.be/data

- **Frequency**: Ad hoc. The system shows the latest disaster (flood) of Lao PDR was in June 2021.
- **Measurement**: Number of People affected
- **Source**: EM-DAT, CRED https://public.emdat.be/data
- **Threshold**: A Disaster affects more 40,000 people. The threshold is established based on recent data trend.

Note: The Government of Laos has established the **Laos Disaster Information Management (LaoDi) system**, which is based on the Desinventar system, that serves as a repository for disaster information at the Ministry of Labor and Social Welfare. The Ministry and UNDP are working together to revamp the platform and it expected to be available online in February 2022. The LaoDi is conceptualized as a Platform that allows users to visualize and download data relating to hazards; social, ecological, physical and economic vulnerability and loss from natural and technological hazards. Once available, LaoDI could be used as the source of this indicator.

8. Number of Earthquakes

- **Justification**: Some seismic activity has been reported in the northeastern part of the country, with increased frequency. In Oct 2021, four earthquakes were reported with magnitude range from 1.6 to 4.7 Richter. In Jun 2021, seven earthquakes were reported by the Department of Meteorology and Hydrology. In November 2019, the earthquakes measuring 6.4 and 5.9 on the Richter scale struck Hongsa district, Xaybouly province, where Hongsa Lignite Mine Mouth Power Plant, capacity 1,878 MW, is located.
- **Frequency**: Ad hoc
- **Measurement**: number of earthquakes and its magnitude.
- **Source**: Department of Meteorology and Hydrology, the Ministry of Natural Resources and Environment. Telephone: 021 215 010. The data need to be requested from the department, with letter which indicate period, data type and data disaggregation requirements (e.g national, provincial) from concerned organizations.
  Lao National Earthquake Data Information Center Facebook page provides the data with 24 hours when an earthquake is detected.
- **Threshold**: more than 10 earthquakes reported per month or/and when a 5.5 Richter strikes the country. The threshold is established based on recent data trend.

9. Air quality

- **Justification**:
  - UNCTAD Vulnerability Profile of Lao PDR 2021 suggests that Lao PDR's Environmental Performance Index is lower than the regional average. A comparison with the regional average reveals that the main source of vulnerability is environmental health, which includes indicators on air quality, water and sanitation and lead exposure, rather than biodiversity.

- Contributors to poor air quality in Laos include burning fuel oil, the mining industry, vehicle emissions, and agricultural burning. Available data indicates that Vientiane is a city with consistently high levels of air pollution.

- **Frequency**: Daily
- **Measurement**: Air Quality Index
- **Source**: https://www.iqair.com/laos.
- **Threshold**: Air Quality Index is not more 101 (healthy level is 1-100) or PM2.5 concentrations not more than 35.4 µg/m³

Note: Lao Technical Guideline on Air Pollution Control, which was approved in April 2021, suggests that Lao air quality data could be accessed online through www.aqm.monre.gov.la , it is expected that the website will be accessible soon.

10. Number of confirmed COVID-19 cases

- **Justification**:
  - As of 17 Nov 2021 total confirmed COVID-19 cases in Lao PDR is 57,397 and total deaths is 112. The figures are lower than its neighboring countries. However, the pandemic has put a lot of pressure to Lao health system which has already been overloaded before the pandemic started. The General Government Health Expenditure (GGHE) to GDP is low at 1.7% in 2017, 1.9% in 2018 and 1.8% in 2019[4], WHO target at 4%.
  - The government containment measure has largely successful containing the number of new COVID-19 cases, but it has negative impacts on livelihoods, employment, tourism and other economic activities.
- **Frequency**: Daily
- **Measurement**: Number of confirmed cases.
- **Source**: Lao COVID-19 Task Force https://www.covid19.gov.la/index.php (link to daily updated dashboard : https://app.powerbi.com/view?r=eyJrIjoiM2JkZWRhNTQtNDY5YS00YWM3LWI4ZjUtNmExM2VmZDM4YjU5IiwidCI6ImNkOWNiOGVjLWU2MjEtNDcyYS05NzlhLTU0OWFiNWJhMjQ3MCIsImMiOjF9)
- **Threshold**: more than 1,000 confirmed cases per day. The threshold is established based on recent data trend.

11. Number of deaths from road accidents

- **Justification**: Number of road accidents and fatalities is increasing. The number of annual fatalities in 2008 is 599 and in 2020 is 1,031, a 72% increase. The number of people killed in road accidents in 2008 is more than the total deaths (409) from natural disasters from 2000 to 2021.
- **Frequency**: Monthly

[4] National Health Accounts Report, FY 2019. July 2021

- **Measurement**: Number of deaths
- **Source**: Traffic Police Department, Ministry of Public Security. Monthly data and updated data can be requested from Cabinet Office of Ministry of Public Security with official letter from concerned organizations.
- **Threshold**: 100 deaths per month. The threshold is established based on recent data trend.

12. Air traffic to Wattay International Airport

- **Justification**: The second wave of COVID-19 since April 2021 has adversely affected hospitality-related businesses, particularly hotels, restaurants and airlines which struggled to recover since first outbreak. Mobility data shows air traffic to the Vientiane Wattay Airport has dropped dramatically. Limited mobility negatively effects activities in service.
- **Frequency**: Daily
- **Measurement**: Percentage
- **Source**: Flightradar24 (https://www.flightradar24.com/data/airports/vte/statistics) and author calculated.
- **Threshold**: Percentage of tracked flights to scheduled flights is below 10%

13. Number of Tourist Arrivals

- **Justification**: Before COVID-19, tourism was one of largest sources of foreign exchange earnings, only behind mining and electricity. The sector has been hard hit by COVID-19 lock down. As of June 2020, 80% of workers in hotels and restaurants were laid off, 30-60% of staff of tour operators were on leave without pay[5].
- **Frequency**: Monthly
- **Measurement**: Monthly growth rate
- **Source**: Tourism Development Department, Ministry of Information Culture and Tourism.
- **Threshold**: Monthly growth rate is equal to or lower than -30%. The threshold is established based on recent data trend.

Annex 1. Indicator data

[5] LAO PDR TOURISM COVID-19 RECOVERY ROADMAP 2021-2025, July 2021

DEPARTMENT OF
ECONOMIC AND
SOCIAL AFFAIRS

Nepal

Report of the DESA project, "Establishing crisis response process in the LDC monitoring framework for graduating and graduated countries"

October 2021

This report was prepared under the capacity development activities of the Development Policy Branch (DPB), Economic Analysis and Policy Division (EAPD), United Nations Department of Economic and Social Affairs (DESA). The Project is funded by the Regular Progamme of Technical Cooperation. Inputs from the project consultant Ms. Arshia Karki are gratefully acknowledged. For more information, please contact Namsuk Kim, EAPD/DESA (kimnamsuk@un.org). The content, findings, interpretations and conclusions as expressed in this report do not necessarily represent the views of the United Nations or the Government of Nepal.

Table 1. Indicators for crisis monitoring

	Category	Name	Frequency	Unit	Source	Threshold
1.	Macroeconomic (Financial Indicator)	Net Liquidity	Monthly	Percent	NRB[1], BFS	Minimum required 20%
2.	Macroeconomic (Financial Indicator)	Core Capital Adequacy Ratio (CCAR)	Monthly	Millions of Rupees	NRB, BFS	Minimum required by NRB regulation is 6%
3.	Macroeconomic (Financial Indicator)	Capital Adequacy Ratio (CAR)	Monthly	Millions of Rupees	NRB, BFS	Minimum required by NRB regulation is 10%
4.	Macroeconomic (Financial Indicator)	Non-performing Loan to Total Loan	Monthly	Percent	NRB, BFS	5% international standard
5.	Macroeconomic (Financial Indicator)	Workers' Remittances	Monthly	Millions of Rupees	NRB	3,683 USD million
6.	Health and Social Indicator	Child mortality rate (<5 years)	Every 5 years	Percent	MICS[2]	25 deaths per 1000
7.	Health and Social Indicator	Pregnant women protected against tetanus	Every 5 years	Percent	MICS	70 per 100,000
8.	Health and Social Indicator	Gender Parity Index	Every 5 years	Index	MICS	<1.04
9.	Health and Social Indicator	Number of confirmed COVID-19 cases	Daily	Number of cases	ourworldindata.org	>1,000 confirmed cases per day
10.	Environment and Natural Disasters	National Wholesale Price Index (Agricultural commodities)	Quarterly	Index	NRB, EB[3]	250 (average)
11.	Environment and Natural Disasters	Earthquake	Real time	Richter scale	ESN[4]	6 Richter scale
12.	Environment and Natural Disasters	Loss by disasters	Yearly	Millions of Rupees	ESN	

[1] NRB, BFS: Nepal Rastra (Central) Bank, Bank and Financial Statistics monthly report
[2] MICS: Multiple Indicator Cluster Survey, 2020
[3] NRB, EB: Nepal Rastra (Central) Bank, Economic Bulletin quarterly report
[4] ESN: Environmental Statistics of Nepal, 2019

13.	Environment and Natural Disasters	Floods and landslides	Yearly	Total death/ affected	EM-DAT	>50,000 per year affected

The sections below describe in detail the indicators and their justifications to use it.

a. Macroeconomic Indicators

I have chosen banking and financial indicators to assess early warning signs in the macroeconomic sector of Nepal. The role of financial development in economic growth is significant for developing countries and this holds true for Nepal. Compared to the popular macro indicators such an GDP, GNI, for which data are only available annually, I am using the following indicators as they are available monthly and quarterly and can help predict possible economic crisis. Data sources include Banking and Financial Statistics and the Economic Bulletin from Nepal Rastra (Central) Bank.

1. **Net Liquidity % = Net Liquid Assets to Total Deposits.** Total assets in the banking system have continued to increase and occupies a large portion of the GDP reaching 177.53 percent of GDP in July 2020. However, the growth rate of assets has experienced a fall post covid. 20 out of 27 commercial banks were vulnerable towards liquidity crisis in mid-July 2020. 5 banks were prone to liquidity shock of withdrawal of 5 percent of deposits in a single day, while 13 banks' liquidity ratio would drop below 20 percent after withdrawal of 10 percent deposit in a single day.
2. **Core Capital Adequacy Ratio (CCAR%)**: Core capital to total risk weighted exposures. Core capital or Tier I capital is the basis on which most market judgements of capital adequacy are made; and it has a crucial bearing on profit margins and a bank's ability to compete. Minimum required by NRB regulation is 6%.
3. **Capital Adequacy Ratio (CAR%)**: Total Capital Fund to Total Risk Weighted Exposures. Minimum required by NRB regulation is 10%
4. **Non-performing loan to total loan (NPL)**: NPL is an asset quality related indicator. The trend of NPL has been decreasing each year up to 2010 but started again to increase from 2011. The recent scenario of NPL of overall financial institutions is around 5% and able to maintain the international standard, so the NPL and efficiency of Nepalese financial institutions can be taken as satisfactory. However, in order to ensure financial stability, NPL has to be monitored.
5. **Remittance:** Nepal is one of the largest remittance recipient countries in the world, which stood at around 25% of GDP in 2020. On the other hand, although exports is a reliable source of foreign exchange and capital inflow for a growing economy like Nepal, export earnings has remained sluggish in Nepal since the mid-2000s due to internal instability. It is still quite low and was only 6.8% of GDP in 2020. The increasing inflow of remittance is contributing to maintain a satisfactory BOP position, finance imports, helped in maintaining a stable exchange rate of the Nepali currency (Rupee) and economic stability. Although, there is no exact threshold number for remittances, its importance is clear for the Nepalese import-based economy. Looking at the

yearly average, remittance received threshold is set at 44195 USD billion (2003-2021), which would be roughly 3,683 million per month.

b. Health and Social Indicators

1. **Child mortality rate (<5 years):** This is an SDG target aimed at reaching as low as 25 deaths per 1,000 live births. Although the number has been decreasing, Nepal is still above the threshold. Nepal MICS survey done alongside UNICEF is a five yearly survey. Having higher frequency data for such an important indicator would be beneficial.
2. **Rate of pregnant women protected against tetanus**: This indicator is used as a proxy for maternal mortality rate. The SDG target is less than 70 deaths per 100,000 live births. While Nepal has shown improvement, eliminating maternal tetanus should continue to be a priority. This data is also taken from Nepal MICS and higher frequency data would be more useful.
3. **Gender Parity Index:** This indicator takes into account ratio of girls to boys attending lower basic, upper basic and secondary education. SDG targets to eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations. GPI between 0.97 and 1.03 is regarded as parity between two groups. In 2019, GPI exceeds the threshold for all three education categories.
4. **Number of daily covid cases:** As of 29 Nov 2021, total confirmed COVID-19 cases in Nepal is 821 thousand and total deaths is 11,523. The pandemic has put a lot of pressure to Nepal government which had a health expenditure of only 1.5% as a share of GDP in 2018 which was not far from 1.3% in 2017. The government has only been able to fully vaccinate 27.4% of the population as of November 2021 and 31.6% have received only one dose. Threshold is set at 1000 deaths based on data trends.

c. Environment and Natural Disaster Indicators

1. **National Wholesale Price Index (Agricultural commodities):** This indicator is used as a proxy for climate change which compromises the supply of agricultural commodities thus leading to food inflation which in turn has an impact on poverty. Agriculture still occupies the highest share of GDP at 25% in 2021.
2. **Earthquake by Epicenter and Magnitude:** Due to its location in the region of interaction between the Indian and Eurasian plates, several earthquakes hit Nepal each year, with the first one being recorded in 1260 AD and the recent destructive one in 2015 costing not only thousands of lives but the economy as well. The economic loss amounted close to 7 billion USD.
3. **Loss of lives, livestock, and other effects by type of disaster:** Nepal is prone to a lot of natural disasters. Weak institutional capacity and inter-agency coordination to handle issues relating to environment and climate change, as well as the inadequate means and resources to address these problems are some of the challenges faced by this sector.
4. **Disasters:** Nepal is vulnerable to many natural disasters, of which most common are floods and landslides, and are a yearly occurrence. As a result, they displace thousands of families and

damage hectares of land of planted crops. Threshold is set at 50000 people affected based on data trends.

Annex 1. List and contacts of Government counterparts

1. Mr. Narayan Prasad Pokhrel
   Director and Information Officer at Office of the Governer, Nepal Rastra Bank
2. Mr. Tirtha Raj Chaulagain
   Information Officer, Central Bureau of Statistics, Nepal

Annex 2. Details of the data sources for indicators

Macroeconomic Data: Nepal Rastra Bank

1. Key Financial Indicators: https://www.nrb.org.np/category/key-financial-indicators/?department=bsd
2. Bank and Financial Institutions Monthly Statistics: https://www.nrb.org.np/category/monthly-statistics/?department=bfr
3. Economic Bulletin: https://www.nrb.org.np/category/economic-bulletin/?department=red
4. Monthly remittance data received directly from NRB contact person.

Health and Social Data

Multiple Indicator Cluster Survey

ourworldindata.org

Environment and Natural Disaster Data

Environmental Statistics of Nepal

EM-DAT

DEPARTMENT OF
ECONOMIC AND
SOCIAL AFFAIRS

Solomon Islands

Report of the DESA project, "Establishing crisis response process in the LDC monitoring framework for graduating and graduated countries"

November 2021

This report was prepared under the capacity development activities of the Development Policy Branch (DPB), Economic Analysis and Policy Division (EAPD), United Nations Department of Economic and Social Affairs (DESA). The Project is funded by the Regular Progamme of Technical Cooperation. Inputs from the project consultant Ms. Miliana Ratu are gratefully acknowledged. For more information, please contact Namsuk Kim, EAPD/DESA (kimnamsuk@un.org). The content, findings, interpretations and conclusions as expressed in this report do not necessarily represent the views of the United Nations or the Government of Solomon Islands.

1 Solomon Islands Country Profile

The Solomon Islands is an archipelago group of 992 islands, located in the "Ring of Fire" the earthquake belt of the Pacific region, situated in the tropical southwestern Pacific Ocean. It comprises of nine main island groups, among a double chain of volcanic islands and coral atolls. Like most Pacific Island countries, the Solomon Islands relies heavily on agriculture, fisheries and forestry for economic development and livelihoods. The latest census (2009) showed a total population of 515,870, with about 60% under the age of 25 years[1]. There are active volcanoes, destructive cyclones, tsunamis and earthquakes that occur regularly. The total land mass is 28.4km^2, with 800,000 ha under some agriculture use in the Solomon Islands.[2]

Pre-COVID19, the economy has continued to show steady growth, and the Government commenced with its preparation of the smooth transition with assistance from the UN.

Table 1: Solomon Islands Macroeconomic Indicators[3]

Indicator	2012	2013	2014	2015	2016	2017	2018	2019
GDP growth rate (constant prices, per cent change)	4.56	3.02	2.25	2.54	3.22	3.69	3.86	2.70
GDP (current prices, billions USD)	1.06	1.13	1.17	1.16	1.23	1.28	1.38	1.44
Inflation rate (per cent change)	5.91	5.39	5.17	-0.56	0.50	0.48	2.66	0.35
Government balance (per cent of GDP)	3.66	4.14	2.10	-0.01	-3.92	-4.39	0.65	-2.27
Current account balance (billions USD)	0.02	-0.04	-0.05	-0.04	-0.05	-0.06	-0.07	-0.10
Net ODA received (millions USD)	305.10	289.83	200.52	190.03	175.50	186.80	N/A	N/A
Exports of goods and services (current prices, billions USD)	0.64	0.60	0.60	0.52	N/A	N/A	N/A	N/A

In March 2016, the Solomon Islands met two or the three thresholds of graduation from LDC status for the first time. In July 2018, ECOSOC endorsed the CDP's recommendation to graduate the Solomon Islands from LDC status. The General Assembly resolution A/RES/73/133 adopted on 13 December 2018, decided that Solomon Islands would graduate six years after the adoption[4] of the resolution, this being on **13 December 2024**.[5]

Thus, Solomon Islands is classified as a **graduating LDC**. According to the E/2021/33 CDP Report on 21 February 2021, together with all available data at that time, **none** of the graduating countries appear to

[1] Solomon Islands Government 2009

[2] FAO 2020b

[3] Source: IMF, World Economic Outlook Database, October 2019 edition, accessed 20 Nov 2019. For net ODA and Exports of Goods & Services, World Bank, World Development Indicators, accessed 20 Nov 2020.

[4] Year of Inclusion for Solomon Islands was 1991

[5] List of Least Developed Countries (as of 11 February 2021)

be at risk of falling back into the LDC category. However, **Solomons Islands** remains highly vulnerable to economic and environmental shocks, as represented by its high economic and environmental vulnerability index (EVI) score, which also faces challenges posed by the socioeconomic consequences of COVID19.

2 Existing Monitoring Indicators

2.1 Indicators monitored by CDP

Background information and reports provided by EAPD determine the level of existing data for Solomon Islands. The refined LDC criteria and indicators are monitored annually by CDP[6]. The indicators include (1) gross national income (GNI) per capita; (2) human assets index (HAI) which include 3 indicators for the health index and 3 indicators for the education index; and, (3) economic and environmental vulnerability index (EVI) which include 4 indicators for the economic vulnerability index, and 4 indicators for the environmental vulnerability index.

Table 2: Solomon Islands LDC Indicators from 2016-2021[7]

LDCs Indicators	Graduation Threshold	Solomon Islands					
		2016	**2017**	**2018**	**2019**	**2020**	**2021**
GNI per capita	$1222 or above	1,571	1,677	1,692	1,686	1721	1,843
HAI	66 or above	72.6	72.7	73.2	73.6	74.0	74.2
EVI	32 or below	51.5	51.8	51.9	51.3	50.3	45.1

Official statistics summarise the LDC indicators above.[8] In 2021, the Solomon Islands GNI per capita was 1,843 per capita and the HAI was 74.2, showing both indicators well above the graduation thresholds. However, EVI continues to remain **very high** at 45.1, due to the country's natural-resource-based economic structure as well as climate-change-induced vulnerabilities.[9] Solomon Islands negotiated successful alternative arrangements for duty-free quota-free market access with trading partners, including the European Union, United Kingdom and Northern Ireland, while it started negotiating with others such as China. Similar to other LDCs, the Covid19 pandemic has highlighted critical gaps in the health security in the country.[10]

[6] See Annex 2 Refined LDC criteria and their indicators

[7] CDP Secretariat, website http://cdp.un.org

[8] CDP2020/PLEN/9e, page 6

[9] CDP Report on the twenty-third session (22-26 February 2021), E/2021/33, [16].

[10] Ibid [68]

3 Crisis Monitoring Indicators

According to the E/2021/33 CDP Report on 21 February 2021, together with all available data at that time, none of the graduating countries appear to be at risk of falling back into the LDC category. The Solomons Islands however remains highly vulnerable to economic and environmental shocks, as represented by its high economic and environmental vulnerability index score, which also faces challenges posed by the socioeconomic consequences of Covid19.

The Committee recommends that development and trading partners support the country to diversify its economy, build disaster resilience and increase health security. Given the high vulnerability of the economic and environment shocks, the following section will address the natural disasters indicators first, followed by health and other disasters, and lastly, the macroeconomic indicators.

Annex 2 provides a list of potential indicators suggested for rigorous monitoring.

3.1 Macroeconomic

In the Solomon Islands, the contribution of agriculture to GDP is approximately 35% - 40%, where 800,00 ha of its land mass is under agricultural use, which is about 3.9% of total land area.11 Economic contribution of agriculture is derived from two major sources: commodity and non-commodity export, where approximately 40,000 households grow coconuts and 20,000 grow cocoa as export cash crops. However, commercial logging accounts for about 18% of government revenue in the Solomon Islands and at over 70% of exports. Limited export diversification has heightened the vulnerability of LDCs. Fisheries provide a major source of food and income for multiple countries,and offer substantial economic prospects for the Pacific region - either the oceanic category where tuna is the region's primary catch, and coastal, that would include multiple fish species as well as cephalopods, crustaceans, shellfish and eels.

At the end of November 2021, the International Monetary Fund[12] completed the 2021 Article IV Mission to Solomon Islands and released the following statement:

"Strong and timely containment measures have successfully prevented a domestic COVID-19 outbreak. The Solomon Islands' economy has nevertheless been hit hard by the pandemic. Following a contraction in 2020, real GDP growth is projected to improve to 0.4 percent this year, commencing a gradual recovery underpinned by relaxation of COVID-19 related restrictions and construction activity. The fiscal deficit is expected to widen this year, from 2.4 percent of GDP in 2020. Foreign reserves remained robust at about 11.5 months of prospective imports (US$708 million) as of end-October 2021, reflecting inflows from development partners, subdued imports, and the new allocation of IMF Special Drawing Rights (SDRs). Inflation has been muted but is expected to increase. Labor market conditions have deteriorated, and the pandemic is likely to have disrupted progress in poverty reduction and human development.

[11] "Covid19 and food systems in the Indo-Pacific" ACIAR, Chapter 5, page 98-100.

[12] An International Monetary Fund (IMF) team led by Mr. Jarkko Turunen conducted a virtual mission to Solomon Islands during October 19 to November 5, 2021 to undertake discussions for the 2021 Article IV Consultation. https://www.imf.org/en/News/Articles/2021/11/08/pr21327-imf-staff-completes-2021-article-iv-mission-to-solomon-islands

Risks to the outlook are skewed to the downside, with the main risk being community transmission of COVID-19, given low vaccination rates and weaknesses in health infrastructure. Delays to border reopening pose a key risk to the economic recovery. Vulnerabilities are exacerbated by a weaker fiscal position, owing largely to the impact of the pandemic on revenues and expenditures. Solomon Islands remains vulnerable to the impacts of climate change and natural disasters."

3.2 Natural Disasters

Solomon Islands still remains vulnerable to economic and environmental shocks, and its main industry, logging, is in decline, resulting in lower duty collections and economic diversification is limited. Commercial logging accounts for about 18% of government revenue in the Solomon Islands and at least 60% of exports. Climate change remains as the single greatest threat to the livelihoods of many Pacific Island nations, the Solomon Islands also faces two environmental challenges in ensuring a sustainable future, the logging industry and the rural-urban drift into the capital city, Honiara.[13] Under EVI there are 4 **economic vulnerability** indexes (1) share of agriculture, hunting, forestry and fishing; (2) remoteness (3) merchandise export concentration and (4) instability of exports of goods and services; and 4 **environmental vulnerability** indexes (5) share of population in low elevated coastal zones, (6) share of population living in drylands (7) instability of agricultural production and (8) victims of disasters.

3.3 Health

Continued delays in vaccine access, the extent of mutation scenarios and changes in policy support led to a revision in the growth compositions of advanced and emerging markets and developing economies in the IMF's July 2021 World Economic Outlook (WEO) Update.

3.4 Other emergencies – Telecommuications and Energy

Solomon Islands lags behind other developing countries' criteria in ICT and transport, adding to the lack of infrastructure for mobile phone connectivity. The mobile phone subscribers, per 100 people, has an average value of 13.06 subscribers per 100 people from the period 1960 to 2019[14]. The latest value from 2019 is **71.38** subscribers per 100 people. For comparison, the world average in 2019 based on 161 countries is 112.32 subscribers per 100 people.

4.0 Suggested Indicators for Crisis Monitoring

The suggested indicators provided in Table 3 below have been largely sourced from the Central Bank of Solomon Islands reports online. The attached excel files include raw data of the indicators. Annex 2 provides a list of potential indicators. Table 3 below provides the suggested indicators for crisis monitoring.

[13] Solomon Islands State of Environment Report, (2019) Honorable Dr Culwick Togomana, Solomon Islands Minister of Environment, Climate Change, Disaster Management and Meteorology, Honiara, Solomon Islands https://www.sprep.org/sites/default/files/documents/publications/soe-solomon-islands-2019.pdf

[14] Using a minimum of 0 subscribers per 100 people in 1960 and a maximum of 73.83 subscribers per 100 people in 2018. https://www.theglobaleconomy.com/

Table 3. SUGGESTED INDICATORS FOR CRISIS MONITORING

Category		Name	Frequency	Measurement	Source	Threshold
Macroeconomic	1	Inflation	Every 6months	Percentage	Central Bank of Solomon Islands	Above 4%
Macroeconomic	2	Foreign Reserves	Monthly (until Dec19), Annually (until Dec21)	SBI	Central Bank of Solomon Islands	Approximately 2 months of import cover
Macroeconomic	3	Visitor Arrivals	Monthly, Quarterly	Per Visitor	Central Bank of Solomon Islands	30% below the (pre-covid) 5yr annual average.
Macroeconomic	4	Timber (Logs & Sawn) Exports	Quarterly	SBD'000	Central Bank of Solomon Islands	**Determine unsustainable harvesting level with the Department of Environment and Ministry of Forestry.*
Disasters	5	People directly affected	Ad hoc, however upon impact – estimate loss is provided in 3 phases: (i) First 72 hours; (ii) Within 2 weeks; (iii) 3rd & 4th week of disaster	No. of people affected	NDMO CBSI	Where 1,000 jobs/ employees are affected
Disasters	6	Losses incurred		USD million	NDMO CBSI	Where estimated losses exceed the average, US$20.5m per year
Disasters	7	Buildings Damaged		No. of buildings damaged	NDMO CBSI	Where buildings damaged exceed the average,
Health and other emergencies	8	Covid confirmed cases	Daily	Number of individuals	WHO https://covid19.who.int/table	New daily Covid death rates in the last 24 hours
Health and other emergencies	9	Hospital access	Daily	Number of deaths	WHO https://covid19.who.int/table	Where 1,000 jobs/employees are affected in the capital or urban area and/or where 50% of the rural
Health and other emergencies	10	Health workforce	Per 10,000 population	Ministry of Health	WHO	Where health clinical staff remain below 'per 10,000 ratio'.

MACROECONOMIC INDICATORS

Indicator 1: Inflation

Description:	The CPI is a measure of the average change in the price levels of a basket of consumer goods and services purchased by households at a specified time relative to a base year. The current CPI is referred to as the Solomon Islands CPI given its coverage of Honiara urban, Auki urban, Gizmo urban and Noro urban as a proxy for the country.
Justification:	Headline inflation for six months, to December 2021 is forecast to be contained at 3% and core inflation at 2.2%. It is anticipated that crude oil will drive up transportation costs and pass-through effect to other consumer items especially housing and energy. [15] In 2022, headline inflation is forecast between 3% to 4% and core inflation between 2% and 3% on broad assumptions that – world commodity prices rise, positive domestic economic growth, and government price control to repressed unsubstantial price mark-ups in regulated consumer items.[16]
Frequency:	Every 6 months
Measurement:	Percentage (%)
Source:	Central Bank of Solomon Islands www.cbsi.com.sb Solomon Islands National Statistics Office https://www.statistics.gov.sb/statistics/economic-statistics
Thresholds:	Above 4%

Indicator 2: Foreign Reserves

Description:	International foreign reserves in Solomon Islands were reported at SBD $5,441million, as at 8th December 2021. The CBSI Act 2012 stipulates that the CBSI will manage our foreign reserves with a goal to achieve the following: Safe, Liquidity and Yield. **Foreign reserves were at the brink of depletion:** • Between the years 1998 to 2003 were the darkest years in the modern history of our country. CBSI Annual Report 2003 shows that foreign reserves level was approximately less than SI$200 million which is equivalent to USD $40.0million. • During the ethnic crises in the year 2000-2002, foreign reserves were at the brink of depletion. • This critical situation has called for tighter foreign exchange regulation control interventions to protect foreign reserves from capital flight. • Since then, our foreign reserves have hit high records throughout the years till now.
Justification:	In 2002, foreign reserves went far below the foreign reserves adequacy level, declining to its lowest level, equivalent to only one month of import

[15] https://www.cbsi.com.sb/wp-content/uploads/2021/09/CBSI-Monetary-Policy-Stance-September-2021.pdf
[16] https://www.cbsi.com.sb/wp-content/uploads/2021/09/CBSI-Monetary-Policy-Stance-September-2021.pdf

	cover. At one stage between the years 2001 & 2002 it was equivalent to just around two weeks of import cover.
Frequency:	Monthly (until December 2019), Annually (until December 2021)
Measurement:	SBD
Source:	Central Bank of Solomon Islands: Home Key Statistics
Thresholds:	Approximately 2 months of import cover

Indicator 3: Visitor arrivals

Description:	Information on visitor arrivals are captured through the Immigration incoming Passenger Declaration Form, collected and compiled by the Solomon Island National Statistics Office, who record Visitors by Country of Residence, Age Group, Occupation, Carrier and Purpose of Visit.
Justification:	A significant decline in international arrivals was recorded since restrictions were imposed on International flights by Solomon Island Government towards the end of March 2020, as part of the State of Public Emergency (SOPE) response towards preventing Solomon Island residents and citizens from the COVID10 pandemic.[17]
Frequency:	Monthly[18]
Measurement:	Number of visitors
Source:	Statistical Bulletin 12/2021 for Visitor Arrivals Statistics Fourth Qtr, 2020. https://www.statistics.gov.sb/statistics/visitor-arrivals
Thresholds:	30% below the (pre-covid) 5yr annual average.

Indicator 4: Timber (Logs & Sawn) Exports

Description:	The Forestry sector has been the major economic driver for the Solomon Islands economy, accounting for over 70% of total export revenue. For decades, Solomon islands has been **logging at an unsustainable rates**, approximately harvesting 325,000 cubic metres per year in the 1990s. In 2017 alone, the country exported **three million cubic meters of logs** – nearly 20 times more than conservative estimates of what would constitute an annual sustainable harvest, according to 2018 Global Witness study commissioned by the country's Ministry of Finance.
Justification:	Timber (logs and sawn) exports are the major commodity that contributes to over 70% of main domestic products for export. Other commodities from Solomon Islands include fish (8%), agriculture products (9%), other selected commodities (0.6%), re-exports (2%).
Frequency:	Quarterly[19]
Measurement:	SBD'000

[17] https://www.statistics.gov.sb/statistics/visitor-arrivals
[18] Monthly Data provided in Annex 3
[19] Quarterly Data provided in Annex 4

Source:	International Trade Statistics – latest available version, Quarter 4, 2016 Solomon Islands National Statistics Office https://www.statistics.gov.sb/statistics/economic-statistics/international-trade
Thresholds:	**Determine unsustainable harvesting level with the Department of Environment and Ministry of Forestry.*
Possible problems:	**Unsustainable harvesting:** The Solomon Islands has more than 2.2 million hectares of forest covering about 80% of its land area, which is spread over some 990 islands, but at this unsustainable rate, the study indicated that the country may be stripped of forest by 2036.

DISASTER INDICATORS

Indicator 5: Number of people affected

Description:	Disasters are disruptive and most often occur unexpected, where people's living standards are severely impacted, such as the livelihoods of urban residents, most of whom would be employed in the capital city and/or those residing in the provinces and practice subsistence farming and fishing.
Justification:	The quick timely release of the estimated data provided shortly after, within 72 hours of the crisis occurring, as seen, particularly with the recent Honiara riots and civil unrest in the capital city.
Frequency:	Frequency: Phase I – Within 72hours of the disaster, Phase II – Within 2 weeks of the disaster; Phase III – Week 3 and 4 of disaster.
Measurement:	USD million
Source:	Central Bank of Solomon Islands (CBSI)[20] Press Release: CBSI estimates $227 million minimum loss to the local economy due to the unrest on the 24th – 26th of November 2021 Riot Impact Assessment November 2021
Thresholds:	Where 1,000 jobs/employees are affected in the capital or urban area and/or where 50% of the rural population per province are directly affected.
Possible use of the indicators:	To estimate the number of people directly affected by a natural disaster (tsunami, earthquake, volcanic eruption), riots and civil unrest, disease outbreak such as measles or the coronavirus pandemic.
Possible problems:	This is an estimate of people that have been **directly** affected, however it does not take into consideration those affected **indirectly** particularly in the provinces where agriculture, fisheries and forestry sectors are prevalent.

[20] Central Bank of Solomon Islands | P.O. BOX 634 | Honiara | Ph.: (677) 21791 | Email: info@cbsi.com.sb | Website: www.cbsi.com.sb

Indicator 6: Losses incurred

Description:	The expected average annual losses, over the long term, are SI$145 million, which is equivalent to **USD20 million**, due to frequent tropical cyclones, earthquakes. In the next 50 years, the Solomon Islands have a 50% chance of experiencing a **single loss** exceeding USD240 million and casualties larger than 1,650 people, and a 10% chance of experiencing a loss exceeding 527 million USD and casualties larger than 4,600 people.[21]
Justification:	The quick timely release of the estimated data provided shortly after, within 72 hours of the crisis occurring, as seen, particularly with the recent Honiara riots and civil unrest in the capital city.
Frequency:	Ad hoc. Frequency: Phase I – Within 72hours of the disaster, Phase II – Within 2 weeks of the disaster; Phase III – Week 3 and 4 of disaster.
Measurement:	USD million
Source:	Central Bank of Solomon Islands (CBSI)
Thresholds:	Where 1,000 jobs/employees are affected in the capital or urban area and/or where 50% of the rural population per province are directly affected.
Possible use of the indicators:	The estimated damage losses incurred allows the Government to number of people directly affected by a natural disaster (tsunami, earthquake, volcanic eruption), riots and civil unrest, disease outbreak such as measles or the coronavirus pandemic.
Possible problems:	This is an estimate of people that have been **directly** affected, however it does not take into consideration those affected indirectly particularly in the provinces where agriculture, fisheries and forestry sectors are prevalent.

Indicator 7: Buildings damaged

Description:	The expected average annual losses, over the long term, are SI$145 million, which is equivalent to **USD20 million**, due to frequent tropical cyclones, earthquakes. In the next 50 years, the Solomon Islands have a 50% chance of experiencing a **single loss** exceeding USD240 million and casualties larger than 1,650 people, and a 10% chance of experiencing a loss exceeding 527 million USD and casualties larger than 4,600 people.[22]
Justification:	The quick timely release of the estimated data provided shortly after, within 72 hours of the crisis occurring, as seen, particularly with the recent Honiara riots and civil unrest in the capital city.

[21] PACIFIC CATASTROPHE RISK ASSESSMENT AND FINANCING INITIATIVE, COUNTRY RISK PROFILE: SOLOMON ISLANDS

[22] PACIFIC CATASTROPHE RISK ASSESSMENT AND FINANCING INITIATIVE, COUNTRY RISK PROFILE: SOLOMON ISLANDS

Frequency:	Ad hoc. Frequency: Phase I – Within 72hours of the disaster, Phase II – Within 2 weeks of the disaster; Phase III – Week 3 and 4 of disaster.
Measurement:	USD million
Source:	Central Bank of Solomon Islands (CBSI)
Thresholds:	Where 1,000 jobs/employees are affected in the capital or urban area and/or where 50% of the rural population per province are directly affected.
Possible use of the indicators:	The estimated damage losses incurred allows the Government to number of people directly affected by a natural disaster (tsunami, earthquake, volcanic eruption), riots and civil unrest, disease outbreak such as measles or the coronavirus pandemic.
Possible problems:	This is an estimate of people that have been **directly** affected, however it does not take into consideration those affected indirectly particularly in the provinces where agriculture, fisheries and forestry sectors are prevalent.

HEALTH INDICATORS

Indicator 8: Covid confirmed cases

Description:	According to the National Situational Report No.22[23], the Solomon Islands recorded a total number of 20 COVID19 cases. All 20 cumulative cases have now recovered, and there are currently Zero active COVID19 cases in the country.[24] There have been no community transmission.
Justification:	Contact tracing can break the chains of transmission through the rapid identification of COVID19.
Frequency:	Ad hoc
Measurement:	Per Individual
Source:	Solomon Islands: WHO Coronavirus Disease (COVID-19) Dashboard With Vaccination Data National Health Emergency Operation Center (NHEOC), Ministry of Health and Medical Services
Thresholds:	New daily Covid death rates in the last 24 hours

Indicator 9: Hospital access

Description:	Hospital beds per capita, relative to a maximum threshold of 18 per 10,000 population. Numerator: Number of hospital beds (excluding labour and delivery beds) Denominator: Total population

[23] https://solomons.gov.sb/wp-content/uploads/2021/05/SLB_SIG-CONSOLIDATED-SITREP-22_COVID-19-RESPONSE_20210512.pdf
[24] https://solomons.gov.sb/ministry-of-health-medical-services/essential-services/learn-about-coronavirus/

Justification:	Access to health services is important for promoting and maintaining health, preventing and managing disease, reducing unnecessary death. Hospital beds are used to indicate the availability of inpatient services. There is no global norm for the density of hospital beds in relation to total population.
Frequency:	According to the 2017 Annual Report for the Ministry of Health and Medical Services, the Average Monthly reporting coverage was maintained at 90%.
Measurement:	Per 10,000 population
Source:	The Medical Statistics Unit of the Ministry of Health and Medical Services of Solomon Islands (see Annual Report 2017) https://unstats.un.org/sdgs/metadata/files/Metadata-03-08-01.pdf
Thresholds:	Using available data, the indicator is computed relative to a threshold value of 18 hospital beds per 10,000 population. This threshold is below the observed OECD high income country minimum (since year 2000) of 20 per 10,000 and tends to correspond to an inpatient hospital admission rate of around 5 per 100 per year. The indicator is computed as follows, using country data on hospital bed density (x), which results in values ranging from 0 to 100: ● Country with a hospital bed density x < 18 per 10,000 per year, the indicator = x /18*100. ● Country with a hospital bed density x >= 18 per 10,000 per year, the indicator = 100.
Possible use of the indicators:	This indicator is designed to capture low levels of hospital capacity; the maximum threshold is used because very high hospital bed densities are not necessarily an efficient use of resources.
Possible problems:	An alternative indicator could be hospital in-patient admission rate, relative to a maximum threshold. However, that indicator is currently not reported widely across regions. In countries where both hospital beds per capita and in-patient admission rates are available, they are highly correlated.

Indicator 10: Health workforce

Description:	Health professionals (physicians, psychiatrists, and surgeons) per capita, relative to maximum thresholds for each cadre (see metadata here)
Justification:	Patient access is the first point of contact for patients and staff to manage and deliver quality health care services.
Frequency:	TBC with the Ministry of Health
Measurement:	Health worker densities by occupation: Data is represented as Per 10,000 population. Health worker distribution by sex: Data is presented in percentage.
Source:	District Health Information System (DHIS2), which is the central mechanism for data storage and management has provincial HR records.
Thresholds:	Where health clinical staff remain below 'per 10,000 ratio'.

ANNEX 1. LIST OF COUNTERPARTS AND GOVERNMENT CONTACTS

	Organisation	Contact Name	Contact Details	Sector
1	Central Bank of Solomon Islands	Mr. Luke Forau, Governor	Email: lforau@cbsi.com.sb Cell: (677) 7341673	Economic
2	Solomon Islands National Statistics Office	Mr Douglas Kimi Government Statistician	Email; dkimie@mof.gov.sb Ph: (677) 23951	Economic
3	Ministry of Health & Medical Service	Permanent Secretary Ms Pauline McNeil	Ph: (677) 28610	Health
4	Ministry of Environment, Climate Change, Disaster Management and Meteorology	Mr David Hiba Director, Solomon Islands Government Meteorological Service Division	Phone: (677) 20332 Fax: (677) 23029 Email: david.hiba@met.gov.sb	Disaster Management
5	Solomon Islands Chamber of Commerce and Industry	Ms. Natalina Hong Chief Executive Officer	Email: ceo@solomonchamber.com.sb	Economic
6	Ministry of Commerce, Industry, Labour and Immigration (MCILI)	Mr. Riley Mesepitu Permanent Secretary	Fax: (677) 25084 Mob: (677) 7496 745 Email: Riley.Mesepitu@commerce.gov.sb	Economic/Labour
7	Solomon Islands Red Cross Society	Ms Joanna Ramorii Tatalu Health manager, SIRC	Email: joannaramotalu17@gmail.com	Humanitarian
8	National Disaster Management Office (NDMO)	Loti Yates Director	Ph: (677) 27937 Cell: (677) 7932795 Email: directorndc@solomon.com.sb	Disaster Management
		George Baragamu Chief Operations Manager	Email: neoc@solomon.com.sb	

ANNEX 2 POTENTIAL INDICATORS FOR CRISIS MONITORING

Criteria	Indicators
Economic vulnerability	External conditions: • Crude oil prices - Bloomberg or Reuters - daily • Exchange rate stability (compared to the USD) • Budget deficits / government cashflow • Global market prices for selected commodities (gold, logs, palm oil, fish, coconut oil)
	Domestic conditions: • Domestic production • Debt % of GDP • Airline debt • Tax revenues
Environmental vulnerability	• Share of population in low elevated coastal zones/in drylands • Instability of agricultural production • Sea water rising
Health index	• Health professional: Skilled migration of clinical medical personnel (doctors and nurses) • Under-five mortality rate • Maternal mortality ratio

ANNEX 3: Visitor Arrivals to the Solomon Islands by Month: January 2009 – December 2020

Month	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
						NUMBER						
January	1,602	1,235	1,600	1,383	1,590	1,415	1,259	1,655	1,514	2,081	1,750	1,857
February	1,422	1,209	1,658	1,591	1,544	1,523	1,465	1,707	1,635	1,855	1,891	1,471
March	1,249	1,766	1,861	1,677	2,184	1,816	1,675	1,675	1,732	2,360	2,378	752
April	1,499	1,820	1,736	1,839	2,021	1,514	1,750	1,799	2,013	2,250	2,106	2
May	1,393	1,137	1,760	1,968	1,857	1,462	1,681	1,896	1,851	2,003	2,434	23
June	1,724	1,797	2,009	3,122	2,317	1,949	2,131	1,984	2,561	2,768	2,523	24
July	1,603	2,264	2,185	2,865	2,574	2,114	2,077	2,319	2,295	2,862	2,537	52
August	1,520	1,845	1,900	2,133	2,022	1,639	1,426	1,918	2,589	2,313	2,484	39
September	1,659	2,153	2,159	2,309	2,291	1,730	2,211	1,428	2,397	2,663	2,695	103
October	1,709	1,813	1,931	1,929	2057	1,798	1,748	2,257	2,500	2,366	2,761	60
November	1,475	1,624	2,195	1,545	1981	1,515	2,101	2,199	2,317	2,044	2,295	16
December	1,405	1,858	1,947	1,564	1993	1,595	2,099	2,357	2,305	2,301	3,053	41
Total	**18,260**	**20,521**	**22,941**	**23,925**	**24,431**	**20,070**	**19,524**	**23,194**	**25,709**	**27,866**	**28,907**	**4,440**
						PERCENTAGES (%)						
Month												
January	8.8	5.5	7.0	5.8	6.5	7.1	6.4	7.1	5.9	7.5	6.1	41.8
February	7.8	5.4	7.2	6.6	6.3	7.6	7.5	7.4	6.4	6.7	6.5	33.1
March	6.8	7.8	8.1	7.0	8.9	9.0	8.6	7.2	6.7	8.5	8.2	16.9
April	8.2	8.1	7.6	7.7	8.3	7.5	9.0	7.8	7.8	8.1	7.3	0.0
May	7.6	5.0	7.7	8.2	7.6	7.3	8.6	8.2	7.2	7.2	8.4	0.5
June	9.4	8.0	8.8	13.0	9.5	9.7	10.9	8.6	10.0	9.9	8.7	0.5
July	8.8	10.0	9.5	12.0	10.5	10.5	10.6	10.0	8.9	10.3	8.8	1.2
August	8.3	8.2	8.3	8.9	8.3	8.2	7.3	8.3	10.1	8.3	8.6	0.9
September	9.1	9.6	9.4	9.7	9.4	8.6	11.3	6.2	9.3	9.6	9.3	2.3
October	9.4	8.0	8.4	8.1	8.4	9.0	9.0	9.7	9.7	8.5	9.6	1.4
November	8.1	7.2	9.6	6.5	8.1	7.5	10.8	9.5	9.0	7.3	7.9	0.4
December	7.7	8.2	8.5	6.5	8.2	7.9	10.8	10.2	9.0	8.3	10.6	0.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Solomon Islands' National Statistics Office

ANNEX 4: Value of Exports by Major Commodity Group, Year and Quarter: 2007-2015

HS Code	Commodity	Qtr ended on same period a year ago % change	QUARTER																	
			2015				2014				2013				2012				2011			
			Dec	Sep	Jun	Mar	Dec	Sep	Jun	Mar	Dec	Sep	Jun	Mar	Dec	Sep	Jun	Mar	Dec /r	Sep /r	Jun	Mar
			SBD '000																			
	Total Timber	*44.7%*	**819,202**	**467,932**	**443,298**	**516,943**	**566,299**	**591,632**	**434,333**	**417,791**	**485,173**	**427,416**	**424,199**	**504,909**	**419,341**	**455,757**	**384,308**	**395,433**	**439,586**	**388,878**	**403,895**	**320,261**
4403	Timber Logs	*44.9%*	807,340	*453,072*	433,476	508,028	557,218	575,748	420,904	398,956	465,387	411,844	406,561	486,466	*402,912*	431,558	360,363	378,483	415,822	376,137	*387,344*	*301,782*
4407	Timber Sawn	*30.6%*	11,862	*14,859*	9,822	8,916	9,081	15,884	13,430	18,834	19,786	15,572	17,638	18,443	*16,429*	24,199	23,945	16,950	23,764	12,741	*16,551*	*18,480*
	Total Fish	*-47.7%*	**86,318**	**62,371**	**60,791**	**91,664**	**165,149**	**126,362**	**106,077**	**66,298**	**159,037**	**140,168**	**63,937**	**83,552**	**124,040**	**225,535**	**11,074**	**84,502**	**101,694**	**122,613**	**69,127**	**40,433**
0302-0305	Fish -	*-51.0%*	77,119	*55,532*	54,499	87,029	157,372	120,265	98,349	59,053	149,770	135,196	61,155	79,712	116,665	182,295	10,248	77,797	97,037	110,325	*66,282*	*37,983*
1604	Fish Canned	*18.3%*	9,199	*6,839*	6,292	4,635	7,777	6,097	7,729	7,245	9,267	4,972	2,782	3,840	7,375	43,239	826	6,705	4,657	12,287	*2,846*	*2,451*
	Total Agricultural Products	*29.8%*	**91,491**	**106,972**	**134,742**	**90,397**	**70,465**	**87,067**	**140,493**	**102,796**	**85,004**	**100,260**	**104,109**	**52,412**	**162,113**	**105,247**	**162,456**	***156,203***	**133,073**	**110,035**	**239,213**	**147,803**
1203	Copra	*85.2%*	22,994	*14,807*	17,130	18,732	12,416	16,349	24,894	19,614	10,245	8,805	17,531	5,700	43,704	29,982	56,395	74,417	21,228	17,099	*85,947*	*60,084*
15111000	Palm Oil	*-62.6%*	11,114	*46,841*	61,194	49,447	29,716	28,719	73,167	55,861	50,777	57,422	57,095	27,342	93,092	51,616	69,743	62,263	76,800	30,554	*94,479*	*63,543*
12071000	Palm Kernel Oil/Meal	*485.1%*	37,185	*6,392*	10,304	8,361	6,355	4,175	11,673	6,997	8,486	6,031	6,069	4,332	7,214	8,698	8,995	6,906	14,063	18,652	*15,769*	*10,301*
18010000	Cocoa	*-63.5%*	7,540	*27,781*	42,605	12,146	20,651	33,956	25,533	15,058	13,184	23,917	17,799	12,281	15,714	12,090	25,962	11,745	20,981	43,729	*43,019*	*13,876*
15131000	Coconut Oil	*853.5%*	12,658	*11,150*	3,509	1,712	1,327	3,869	5,225	5,266	2,312	4,085	5,615	2,757	2,390	2,861	1,361	871	-	-	-	-
	Other Selected Commodities	*-26.4%*	**6,089**	**5,430**	**3,106**	**7,366**	**8,274**	**69,299**	**90,136**	**152,661**	**172,636**	**165,229**	**277,243**	**172,438**	**172,395**	**159,163**	**211,858**	***260,478***	**219,122**	**212,750**	**90,807**	**7,371**
5080011	Marine Shells & Coral	*-42.0%*	1,106	*684*	119	575	1,906	1,990	2,264	2,077	338	929	975	-	2,048	2,141	1,755	2,242	3,716	1,774	*2,941*	*2,068*
71081000	Gold	*-18.0%*	4,716	*4,505*	2,813	6,209	5,749	66,607	87,236	149,801	171,088	162,973	275,283	171,280	206,712	156,094	209,078	257,342	213,611	210,264	*87,492*	*5,114*
7206	Scrap Metal	*-56.9%*	267	*241*	174	582	619	701	636	783	1,210	1,327	985	1,158	1,024	928	1,025	895	1,795	712	*374*	*189*
	Other Domestic Exports	*61.9%*	**42,810**	***25,272***	**39,646**	**36,311**	**26,447**	**22,445**	**21,488**	**19,185**	**23,019**	**24,177**	**51,868**	**23,145**	**-**	**2,845**	**18,173**	**22,552**	**27,220**	**7,117**	**9,046**	**8,132**
	RE-EXPORTS	*3.3%*	**19,149**	***12,053***	**4,738**	**1,979**	**18,539**	**62,375**	**7,286**	**4,894**	**1,104**	**2,463**	**327**	**9,741**	**5,515**	**7,803**	**23,149**	**20,701**	**12,812**	**4,716**	**0**	**-**
	TOTAL EXPORTS	*24.5%*	**1,065,058**	**680,029**	**686,322**	**744,660**	**855,174**	**959,179**	**799,813**	**763,624**	**925,973**	**859,713**	**921,683**	**846,197**	**883,404**	**956,349**	**811,018**	**939,869**	**933,506**	**846,108**	**812,089**	**524,000**

HS code	Commodity	QUARTER															
		2010				2009				2008				2007			
		Dec	Sep	Jun	Mar	Dec	Sep	Jun	Mar	Dec	Sep	Jun	Mar	Dec	Sep	Jun	Mar
		SBD '000															
	Total Timber	**321,716**	**262,087**	**230,116**	**184,102**	**202,540**	**200,072**	**167,109**	**168,380**	**229,008**	**255,681**	**224,436**	**185,497**	**239,646**	**187,696**	**167,900**	**211,986**
4403	Timber Logs	313,590	248,833	216,463	172,932	192,039	193,658	161,752	159,963	218,263	240,537	211,119	174,051	224,239	177,846	161,281	203,448
4407	Timber Sawn	8,126	13,254	13,653	11,170	10,501	6,414	5,357	8,417	10,745	15,144	13,318	11,446	15,406	9,850	6,619	8,538
	Total Fish	**62,205**	**35,684**	**40,753**	**50,365**	**37,195**	**46,757**	**49,322**	**29,119**	**76,242**	**100,778**	**65,865**	**49,938**	**94,033**	**43,213**	**12,780**	**7,730**
0302-3	Frozen Fish	59,646	35,054	38,234	45,635	33,850	41,642	42,129	27,842	72,898	95,660	61,630	45,715	90,893	41,590	9,581	3,151
1604	Fish Canned	2,559	630	2,519	4,731	3,346	5,115	7,193	1,277	3,344	5,118	4,235	4,223	3,139	1,623	3,200	4,579
3054000	Fish Smoked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Agrilcultural Produducts	**144,457**	**108,656**	**115,295**	**84,163**	**90,402**	**59,655**	**86,351**	**57,005**	**49,721**	**142,228**	**113,488**	**74,552**	**61,020**	**65,010**	**51,267**	**28,676**
1203	Copra	49,740	11,168	19,535	7,927	13,577	11,280	8,716	5,589	35,877	66,149	14,627	39,070	16,699	12,470	6,958	13,931
15111000	Palm Oil	55,694	53,490	52,117	49,936	49,448	19,337	46,278	28,339	-	36,289	68,576	22,925	35,919	37,555	23,782	9,672
12071000	Palm Kernel	10,903	9,068	7,046	6,680	5,825	2,296	4,190	4,304	-	9,689	9,716	5,573	-	-	-	-
18010000	Cocoa	27,363	34,784	34,183	19,620	21,552	26,742	27,167	18,772	13,844	29,771	20,424	5,115	8,049	13,405	19,928	4,150
15131000	Coconut Oil	757	147	2,415	-	0	-	-	-	-	330	145	1,870	353	1,580	599	923
	Other Domestic Exports	**10,727**	**12,059**	**13,681**	**14,376**	**25,079**	**7,667**	**17,640**	**10,379**	**11,529**	**13,357**	**13,094**	**9,819**	**14,818**	**10,602**	**6,213**	**5,913**
5080011	Marine Shells	1,035	1,945	2,395	540	1,931	362	1,606	439	988	1,070	816	339	1,166	667	1,167	827
71081000	Gold	4,811	6,353	7,075	8,212	8,227	2,985	6,735	5,222	4,342	6,673	6,395	2,233	2,237	3,776	831	3,347
7206	Scrap of iron & steel	163	158	125	119	104	204	330	141	231	703	536	1,655	310	202	86	48
	Other Domestic Exports n.e.c	**4,719**	**3,603**	**4,087**	**5,505**	14,817	4,116	8,969	4,575	5,968	4,912	5,346	5,593	11,105	5,957	4,129	1,691
	RE-EXPORTS	**14,165**	**7,101**	**20,965**	**21,101**	**1,866**	**6,880**	**12,277**	**11,022**	**1,525**	**14,972**	**8,505**	**333**	**1,079**	**1,098**	**754**	**367**
TOTAL EXPORTS		**553,270**	**425,588**	**420,811**	**354,108**	**357,082**	**321,030**	**332,699**	**275,905**	**368,026**	**527,017**	**425,387**	**320,139**	**410,596**	**307,619**	**238,914**	**254,672**

COUNTRY SPECIFIC REPORT

CRISIS MONITORING

INDICATORS & THRESHOLDS

FOR

Tuvalu

Prepared for:

United Nations Department of Economic and Social Affairs

Draft Report

25 November 2021

Tuvalu Country Profile

Tuvalu is a country located in the Pacific Ocean which consists of three coral islands named, Nanumanga, Niutao and Niulakita and six atolls called Funafuti, Nanumea, Nui, Nukufetau, Nukulaelae and Vaitupu. This grouping of islands is characterized by their low-lying topography with poor soil quality, small total landmass of 26 square kilometers and it features a small population size of 11,792[1] and with English and Tuvaluan, the two languages spoken, with English as the official language.

The low-lying profile of these islands with the highest point only 15 feet above seas level, makes them very susceptible to sea level rise resultant from climate change. Tuvalu's climatic vulnerabilities are sea level rise with the resultant loss of property. Other climate challenges include damage from tropical storms and storm surges. Two major cyclones of Pam (2015) a category 5 cyclone and Tino (2020) a category 3 cyclone, have been responsible for damages to homes and crops in the islands of Tuvalu and temporary relocation of families with a need for a State of Emergency in both storms and funding for aiding recovery.

The economy of Tuvalu is based on income received from remittances from Tuvaluans living mainly in Australia and New Zealand, fishing licenses, copra exports, internet domain name (.tv) and rights to international telephone codes[2]. The greatest contributor to the economy comes from fishing licenses with minor earnings the sales of fish and agricultural products. As a Small Island Developing State (SIDS) its economy is largely undiversified, with few natural resources and its economic actors have low productive capacities. The country is very susceptible to exogenous shocks from global economic crises as well as environmental hazards such as sea level rise, cyclones, and floods.

Additionally, Tuvalu has a Tuvalu Trust Fund which is financed by New Zealand, Australia, Japan, the United Kingdom and South Korea and invested to provide returns which maintains the trust fund as Tuvalu draws down when necessary. Recently there has also been an increase in tourism which accounts for approximately 5% of the GDP. Healthcare in Tuvalu is free and publicly financed but due to small population size it is also very limited. A major challenge has been from the high incidence of chronic non-communicable diseases which has

[1] World Bank, 2020

[2] www.commonwealthgovernance.org, 2021

a strong link to obesity, which is of major concern in Tuvalu, with many adults being overweight. Tuvalu is presently categorized as a LDC and has been under consideration for graduation pending ECOSOC decision.

Table 1. EXISITING AND POTENTIAL INDICATORS FOR CRISIS MONITORING

Category		In. No.	Name of Indicator	Frequency	Measurement	Source	Threshold
Macroeconomic	Existing indicators		Gross national income (GNI) per capita			UN CDP https://www.un.org/development/desa/dpad/least-developed-country-category-tuvalu.html	
			Human assets index (HAI) - Under-five mortality rate - Prevalence of stunting - Maternal Mortality Rate - Gross secondary school enrolment ratio - Adult literacy rate - Gender parity index for gross secondary school enrolment			UN CDP https://www.un.org/development/desa/dpad/least-developed-country-category-tuvalu.html	

	Existing indicators		Economic and environmental vulnerability index (EVI) - Share of agriculture, forestry and fishing in GDP - Remoteness and landlockedness - Merchandise export concentration - Instability of exports of goods and services - Share of population in low elevated coastal zones - Share of population living in drylands - Instability of agricultural production - Victims of disasters			UN CDP https://www.un.org/development/desa/dpad/least-developed-country-category-tuvalu.html	
	Proposed indicators	1	Number of Visitor Arrivals	Monthly	Monthly growth rate	Pacific Data Hub/ Tourism Development Department, Ministry of Information Culture and Tourism	-100%

		2	Imports (covid 19 economic indicators)	Monthly	Percent (%)	Pacific Data Hub https://stats.pacificdata.org/vis?lc=en&df[ds]=ds%3ASPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=M.TV%2BKI.IMP.&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&ly[rw]=GEO_PICT&fs[0]=Topic%2C0%7CMulti-domain%23XDO%23&fs[1]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency	-40
		3	U.S. Exports of Goods by F.A.S. Basis to Tuvalu	Monthly	Millions of Dollars (USD)	Federal Reserve Bank of St. Louis https://fred.stlouisfed.org/series/EXP6227	0.045
		4	Merchandise Export Growth	Monthly	(y-o-y, %)	ASIA REGIONAL INTEGRATION CENTER	-95%

						https://aric.adb.org/macroindicators	
		5	Exchange Rate, Local Currency per US$ (average)	Monthly	Tuvaluan dollar	ASIA REGIONAL INTEGRATION CENTER https://aric.adb.org/macroindicators	0.621
		6	U.S. Imports of Goods by Customs Basis from Tuvalu	Monthly	Millions of Dollars (USD)	Federal Reserve Bank of St. Louis https://fred.stlouisfed.org/series/IMP6227	0.0067
	Proposed indicators	7	Sea level	monthly	Precentage Meters rise	http://www.bom.gov.au/ntc/IDO70056/IDO70056SLD.shtml#stats	2.8
		8	Sea surface temperature	monthly	Precentage change Degrees celcius	http://www.bom.gov.au/ntc/IDO70056/IDO70056WTD.shtml	30 °C

		9	Tropical storm	Ad hoc	No. of people affected	EM-DAT, the International Disaster Database https://public.emdat.be/data	4000
Health and Other Emergencies	Proposed indicators						
		10	Cumulated number of cases of COVID-19	Daily	units	Pacific Data Hub & the Pacific Community (SPC) Public Health Division	53
		11	Cumulated number of deaths due to COVID-19	monthly	unit	Pacific Data Hub & the Pacific Community (SPC) Public Health Division https://stats.pacificdata.org/vis?fs[0]=Pacific%20Island%20Countries%20and%20territories%2C0%7CTuvalu%23TV%23&fs[1]=Pacific%20Island%2	20

						0Countries%20and%20territories%2C0%7CKiribati%23KI%23&fs[2]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency&df[ds]=ds%3ASPC2&df[id]=DF_COVID&df[ag]=SPC&df[vs]=1.0&pd=2020-03%2C&dq=M.TV%2BKI.DEATHS&ly[cl]=GEO_PICT&ly[rw]=TIME_PERIOD	

Existing Indicators

The UN DESA website was used to attain the present background information of Tuvalu concerning existing indicators and how the country measures up for graduation out of LDC status. Graduation from LDC status is annually monitored by the CDP and determined with economic, social, and environmental indicators for a wholistic view of the country's advancement in those three areas for sustainable growth. The existing three broad indicators of development for Tuvalu are gross national income (GNI) per capita, human assets index (HAI) which include 3 indicators for the health index and 3 indicators for the education index; and economic and environmental vulnerability index (EVI) which include 4 indicators for the economic vulnerability index, and 4 indicators for the environmental vulnerability index.

In 2021, Tuvalu recorded its GNI per capita of $6657.00 per capita, the HAI was 82.8, and EVI at 57.1, showing key indicators of GNI and HAI well above the graduation thresholds, in the case of GNI more than fives times higher than the threshold.

LDCs Indicators	**Graduation Threshold**	**Tuvalu (2021)**
GNI per capita	$1222	$6657.00
HAI	66 or above	82.8
EVI	32 or below	57.1

Crisis Monitoring Indicators

Although Tuvalu meets the existing criteria in two key indicators for graduation from LDC status, this has yet to be done. From E/RES/2021/11 on 15 June 2021, the CDP after giving consideration to the vulnerabilities and developmental challenges of Tuvalu for successful movement out of LDC status, concluded to recall its decision for graduation of Tuvalu out of LDC status by 2021 and instead due to the social and economic effects of COVID 19 pandemic have pushed the consideration to 2024. The EVI figure of 57.1 represents the great extent at which Tuvalu is highly vulnerable to economic and environmental exogenic shocks from natural disasters such as drought and hurricanes and due to its reliance on aid from other countries is also at the mercy of the economic viability of these outside economies. The threats of COVID 19 coupled with the economic and environmental vulnerability of the nation has resulted in the deference of its graduation.

Macroeconomic

Based on the monitored indicators of GNI at $6657, Tuvalu is about five times the threshold GNI for graduation and the nation also has a Human Asset Index significantly greater than the level for inclusion. Tuvalu has the socioeconomic capacity for graduation out of the LDC category but the vulnerabilities are a major cause of concern for the CDP. The low-lying nature of the nation which is noted to incur land loss due to sea level rise and the impacts of cyclone Pam (2015) and Tino (2020) resulting in evacuation and about half the population affected[3]. The Tuvaluan economy is based on revenue from fishing licenses, television licenses, funding from the Tuvalu Trust Fund funded by the United Kingdom, Australia and New Zealand and with some small scale fishing and remittances from Tuvaluans abroad. The low productivity and high reliance on imported products also make Tuvalu highly economically vulnerable.

[3] RNZ, **Post-cyclone: State of emergency remains for Tuvalu, 3 February 2020**

Natural Disasters

The low-lying nature of Tuvalu has made it highly susceptible to destruction from hurricanes and flooding, while saltwater incursion to its water table from sea level rise and flooding coupled with low rainfall increases the likelihood of drought.[4] The effects of climate change with sea level rise has been a persistent threat to the livelihood of Tuvaluans with land lost and water levels rise pushing and increasing population into a diminishing amount of land area. Cyclones are developed in areas of high temperature and humidity. High sea surface temperature provides the ideal conditions of warm temperatures over a large water body for the development of cyclones and where the high temperature is for an extended period more powerful and destructive cyclones may arise such as Cyclone Pam of 2015. Based on the EVI, Tuvalu is particularly vulnerable in Instability of agricultural production value 1.6 (index 0.7) and share of population in low elevated coastal zones value 94.7 (index 100).

Health

Tuvalu has no confirmed cases of COVID 19 infections among its 11700 population. As of 22 October 2021, a total of 12,114 COVID 19 vaccination doses have been administered. RNZ reported one person travelling from Tuvalu entering New Zealand who tested positive for COVID 19[5] who was isolated in New Zealand, but this is the only occurrence of the type with Tuvalu still having no confirmed cases of the disease. The lack of cases of COVID 19 in Tuvalu is good as the eventual effects on the health and health care system has been devastating especially in small countries with high incidence of non-communicable disease such as hypertension and diabetes.

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[4] IFRC, **Tuvalu: Communities face climate drought disaster, https://www.ifrc.org/press-release/tuvalu-communities-face-climate-drought-disaster 8 September 2021**

[5] RNZ, "**Traveller from Tuvalu tests positive for Covid-19 in NZ" https://www.rnz.co.nz/international/pacific-news/454774/traveller-from-tuvalu-tests-positive-for-covid-19-in-nz 2 November 2021**

Potential Indicators for Crisis Monitoring

The suggested indicators provided in Table 3 above have been attained sourced from a variety of international institutions with a large portion from the Pacific Data Hub. The included excel files include raw data of the indicators. Below is a list of potential indicators.

1. Number of Visitor Arrivals

Justification:	The government of Tuvalu have recognized the potential of their fledgling tourism sector to increase the economic development of their country. Tourism in Tuvalu has contributed 4.9% (World data, 2021) of their GDP. Although the contribution is very small in this time, it does have the potential to grow and become a more viable source of income for Tuvalu similar to the impact of tourism in many other countries. The lack of travel movement due to covid 19 in mid 2020 resulted in a complete loss of visitor arrivals. This travel downturn trend which occurred would have a negative effect on the fledging tourism industry of Tuvalu. monthly
Frequency:	Monthly
Measurement:	percentage change over previous period
Source:	Pacific Data Hub
Thresholds:	-100 %

- Source: https://stats.pacificdata.org/vis?lc=en&df[ds]=SPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=M.TV%2BKI.VIS.&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&ly[rw]=GEO_PICT

2. Imports

Justification:	The ability to import indicates the willingness to pay for goods not available locally or due to preferences for external goods. This is made possible by the country having sufficient foreign exchange to make inflows of trade possible. Imports for Tuvalu have been used as an indicator for the health of the economy in light of the COVID 19 pandemic, by looking for growth or contraction of importing based on a comparison with the previous year.
Frequency:	Monthly
Measurement:	% change over same period last year
Source:	Pacific Data Hub
Thresholds:	-40

- Source: https://stats.pacificdata.org/vis?lc=en&df[ds]=ds%3ASPC2&df[id]=DF_ECOLEAD&df[ag]=SPC&df[vs]=1.0&dq=M.TV%2BKI.IMP.&pd=%2C&ly[cl]=TRANSFORMATION%2CTIME_PERIOD&ly[rw]=GEO_PICT&fs[0]=Topic%2C0%7CMulti-domain%23XDO%23&fs[1]=Frequency%2C0%7CMonthly%23M%23&pg=0&fc=Frequency

3. U.S. Exports of Goods by F.A.S. (free alongside ship) Basis to Tuvalu

Justification:	this indicator represents the export of goods from the U.S.A. to Tuvalu. This trade measurement can highlight a change in economic viability of Tuvalu, by reflecting a lower ability to buy goods through decreased U.S.A. goods imported.

Frequency:	Monthly
Measurement:	Millions of Dollars (USD)
Source:	Federal Reserve Bank of St. Louis, U.S. Census Bureau, U.S. Bureau of Economic Analysis , U.S. International Trade in Goods and Services https://fred.stlouisfed.org/series/EXP6227
Thresholds:	0.045 Millions of Dollars (USD)

4. Merchandise Export Growth

Justification:	The balance of trade provide insight into the health of the Tuvalu economies. The ability to buy foreign items and likewise the ability to export goods result in utility gains from wider choice to benefit consumers from competition, advancement in technology and greater employment, economies of scale with better resource allocation. Any significant changes in trends of export of goods can highlight positive or negative occurrences in the economy of Tuvalu.
Frequency:	Monthly
Measurement:	y-o-y, %
Source:	ASIA REGIONAL INTEGRATION CENTER https://aric.adb.org/macroindicators
Thresholds:	-95% change over the previous period

5. Exchange Rate, Local Currency per US$ (average)

Justification:	Changes in the exchange rate of the Tuvaluan dollar to the USD has a range of impacts on the local Tuvaluan economy. These impacts would include the ability and attractiveness to engage in merchandise trade with other nations; inflation is another outcome where based on the movement of the value determines whether more or less of that currency is needed to purchase commonly bought commodities. The exchange rate also has a bearing on economic growth throw the effects on the trade balance through ability to import due to greater purchasing power and lower desire to purchase domestically.
Frequency:	Monthly
Measurement:	Tuvaluan dollar
Source:	ASIA REGIONAL INTEGRATION CENTER https://aric.adb.org/macroindicators
Thresholds:	0.621

6. U.S. Imports of Goods by Customs Basis from Tuvalu

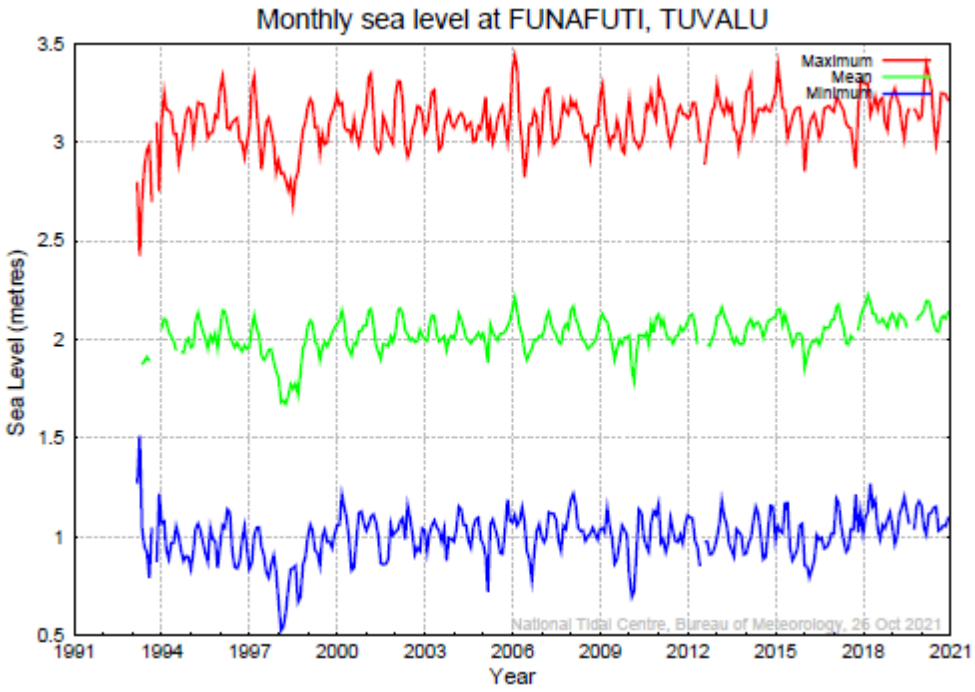
Justification:	this indicator represents the export of goods from the U.S.A. to Tuvalu. This trade measurement can highlight a change in economic viability of Tuvalu, by reflecting a lower ability to buy goods through decreased U.S.A. goods imported.
Frequency:	Monthly
Measurement:	percentage change Millions of Dollars (USD)

Source:	Federal Reserve Bank of St. Louis, U.S. Census Bureau , U.S. Bureau of Economic Analysis , U.S. International Trade in Goods and Services https://fred.stlouisfed.org/series/EXP6227
Thresholds:	0.0067

ENVIRONMENTAL INDICATORS

7. Sea level rise

Justification:	Tuvalu consists of low-lying islands where rising sea level represents the inevitability of major losses and disaster for the country. The need to continuously monitor sea level is of paramount importance to determine when and at what rate mitigating actions are needed. Sea level rise in Tuvalu results in the loss of land and so loss of economic assets which affect the livelihood of the people. The monitoring is based on the Pacific Sea Level and Geodetic Monitoring (PSLGM), which operates under the Climate and Oceans Support Program in the Pacific (COSPPac). It is a continuation of the 20-year South Pacific Sea Level and Climate Monitoring Project (SPSLCMP).
Frequency:	Monthly
Measurement:	Meters
Source:	Source: Australian Government Bureau of Meterology. http://www.bom.gov.au/ntc/IDO70056/IDO70056SLD.shtml#stats
Thresholds:	2.8m

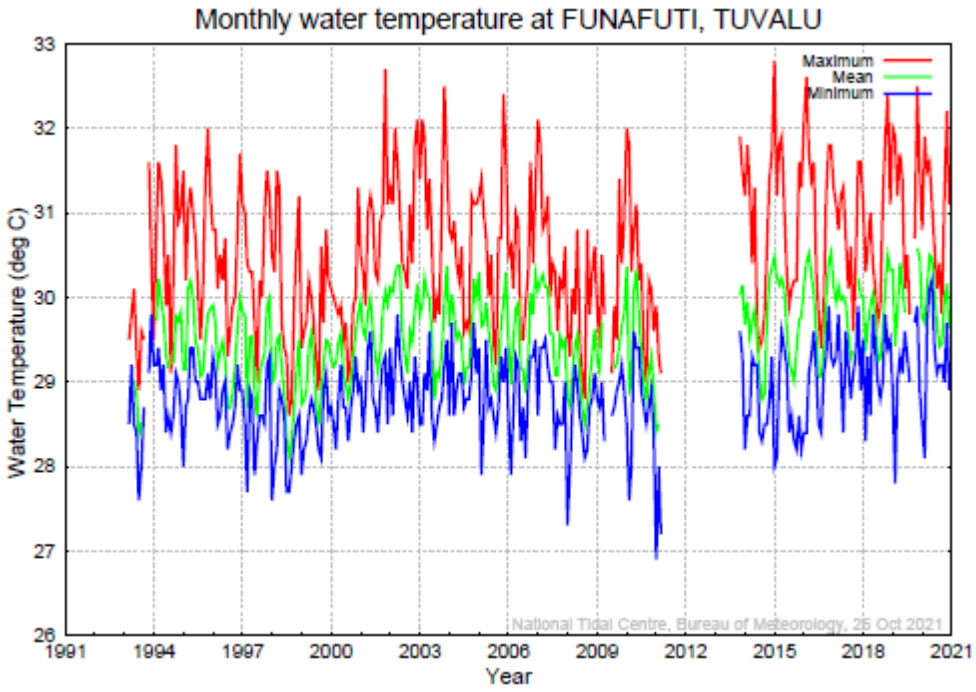


http://www.bom.gov.au/ntc/IDO70056/IDO70056SLI.pdf

8. Sea surface temperature

Justification:	Tuvalu consists of low-lying islands where oceanic activities including storms and other weather systems can greatly affect countries through storm surge and other effects of low-lying coastal areas. Temperature differences recorded at sea surface can give an indication of developing weather systems and possible impending disaster. High water and air temperatures allows more heat energy in the climate for evaporation and can eventually provide the energy for tropical storms. The Pacific Climate Change group has estimated warming occurring at 0.13 ^{o}C per decade from the 1970s. Higher Sea temperatures results in higher air temperatures since Tuvalu consists of small islands which are heavily influenced by maritime climate conditions which impact dry periods, rainfall and storms. Higher ocean temperature also results in higher sea level rise.

	As with Hurricane Pam in March 2015, the sea surface temperature was 30 °C. Higher temperatures provides more energy to increase evaporation and low pressure areas resulting in stronger storms.
Frequency:	Monthly
Measurement:	degrees Celsius °C
Source:	Australian Government Bureau of Meterology http://www.bom.gov.au/ntc/IDO70056/IDO70056SLD.shtml#stats
Thresholds:	30 °C



http://www.bom.gov.au/ntc/IDO70056/IDO70056WTI.pdf

9. Tropical cyclone

Justification:	Tropical cyclones are common in the Pacific region and result in loss and damage to life, infrastructure, and livelihoods. With climate change, SIDS are particularly vulnerable to these natural disasters so must be prepared when they occur. With the damage produced, natural disasters play a significant role as an environmental hazard which may have long term effects on the developmental path of the country which is affected.
Frequency:	Ad hoc
Measurement:	No. of people affected
Source:	EM-DAT, the International Disaster Database https://public.emdat.be/data
Thresholds:	4000

Health Indicators

10. Cumulated number of deaths of COVID-19

Justification:	Tuvalu is one of the few countries which have so far been able to not have any incidence of the covid 19 disease in their countries. Once covid 19 becomes present by either an infected returning national or entering non-national then this has the potential to go from imported cases to community spread very easily and eventually producing the challenges on healthcare resources other small countries have endured. As with many other countries, covid 19 related deaths have occurred once the disease was introduced into the country.

	There is no funeral home or professional burial service in Tuvalu (US Embassy, 2017). Due to high water table, there is no land commercially available for burial, so these services are occur via private individuals using their own land for burial of relatives.
Frequency:	monthly
Measurement:	units
Source:	Pacific Data Hub & the Pacific Community (SPC) Public Health Division
Thresholds:	20

Source:
https://stats.pacificdata.org/vis?lc=en&df[ds]=SPC2&df[id]=DF_COVID&df[ag]=SPC&df[vs]=1.0&dq=M.TV%2BKI.DEATHS&pd=2020-01%2C&ly[cl]=GEO_PICT&ly[rw]=TIME_PERIOD

11. Cumulated number of cases of COVID-19

Justification:	With the lack of presence of any cases of covid 19 in Tuvalu, the current number of cumulated cases are at 0. Any infection occurring on these islands will be the start of a cumulated figure and the rate at which this figure increases will provide an idea of how the government will be able to deal with covid 19 outbreak in the country. The cumulative figure will also provide insight on effectiveness of protocols and education in the country and its possible impact on the healthcare sector. As of 2001 (World Bank, 2021), Tuvalu had 5.6 hospital beds per 1000 persons. The total population is approximately 11,900 persons, so there are

	approximately 66 beds available for the sick. The threshold is set at 53 cases which is 80% of the capacity after which the country will have a major problem managing persons suffering from severe symptoms of covid 19.
Frequency:	monthly
Measurement:	units
Source:	Pacific Data Hub & the Pacific Community (SPC) Public Health Division
Thresholds:	53

DEPARTMENT OF
ECONOMIC AND
SOCIAL AFFAIRS

Vanuatu

Report of the DESA project, "Establishing crisis response process in the LDC monitoring framework for graduating and graduated countries"

November 2021

This report was prepared under the capacity development activities of the Development Policy Branch (DPB), Economic Analysis and Policy Division (EAPD), United Nations Department of Economic and Social Affairs (DESA). The Project is funded by the Regular Progamme of Technical Cooperation. Inputs from the project consultant Ms. Miliana Ratu are gratefully acknowledged. For more information, please contact Namsuk Kim, EAPD/DESA (kimnamsuk@un.org). The content, findings, interpretations and conclusions as expressed in this report do not necessarily represent the views of the United Nations or the Government of Solomon Islands.

1 Vanuatu Country Profile

Vanuatu is an archipelago group of 83 volcanic islands, and is highly exposed to volcanoes, destructive cyclones, and earthquakes that occur regularly. The total land mass is 12.2km^2, of which 15.3% of land is under agriculture use.[1] The latest census (2020) shows a total population of 301,695, with a distribution of 25% in urban areas, and 75% located in the rural areas. Repeated natural disasters, including two Tropical Cyclones Category 5 Pam (2015) and Harold (2020), and recent volcanic eruptions, have decimated food stocks and forced mass displacement in Vanuatu over the last five years.

Vanuatu relies heavily on tourism, agriculture and fisheries for economic development and livelihoods. Pre-COVID19, the economy continued to show steady growth, with tourism arrivals and the offshore financial services sector emerging as the largest earners of foreign income. Even though Vanuatu recorded its first COVID-19 case in November 2020 - much later than the rest of the world - the impact of the border closures from Australia and New Zealand, on the island nation has significantly affected the island economy, with tourism coming to a sudden halt.

Despite the significant impact of Tropical Cyclone Harold and Covied19, Vanuatu is the latest country to graduate from the LDC category on 4 December 2020. The General Assembly commended the efforts and commitment by the Government of Vanuatu to graduate and invited partners to provide full support to the implementation of the country's smooth transition strategy, including by extending international support measures, such as aid for trade, and participation in international forums until 4 December 2025.

Vanuatu is now classified as a **graduated country**. According to the E/2021/33 CDP Report on 21 February 2021, together with all available data at that time, none of the graduating countries appear to be at risk of falling back into the LDC category. However, like other Pacific Island nations, Vanuatu remains vulnerable to climate change, natural disasters and non-communicable diseases, which also faces further challenges posed by the socioeconomic consequences of COVID19.

2 Existing Monitoring Indicators

2.1 Indicators monitored by CDP

Background information and reports provided by EAPD determine the level of existing data for Vanuatu. The refined LDC criteria and indicators are monitored annually by CDP[2]. The indicators include (1) gross national income (GNI) per capita; (2) human assets index (HAI) which include 3 indicators for the health index and 3 indicators for the education index; and, (3) economic and environmental vulnerability index (EVI) which include 4 indicators for the economic vulnerability index, and 4 indicators for the environmental vulnerability index.

[1] FAO 2020b

[2] See Annex 2 Refined LDC criteria and their indicators

In 2021, Vanuatu recorded its GNI per capita of $2,992 per capita, the HAI was 78.4, and EVI at 39.6, showing all key indicators well above the graduation thresholds.

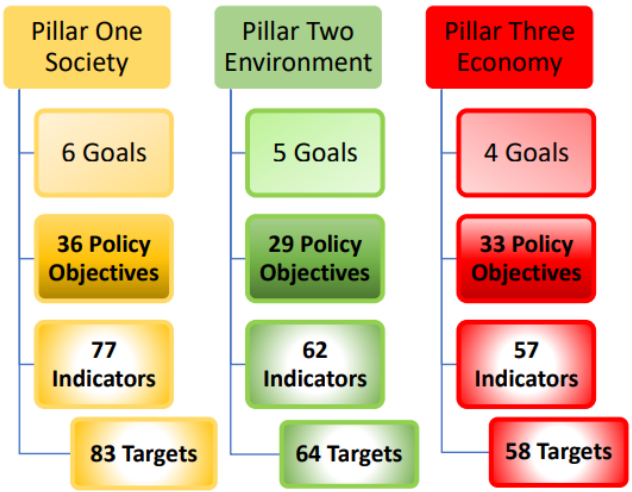
Table 1: LDC Indicators - Vanuatu

LDCs Indicators	Graduation Threshold	Vanuatu
		2021
GNI per capita	$1222 or above	$2,992
HAI	66 or above	78.4
EVI	32 or below	39.6

2.2 Headline Indicators monitored by Vanuatu

Vanuatu has developed national indicators, as part of the **National Sustainable Development Plan Monitoring and Evaluation Framework**[3] to align the monitoring progress of the SDGs with National Goals and Targets. The national headline indicators and targets are monitored under the following three pillars - (1) Society (2) Environment (3) Economy, as presented below. There are a total of 77 indicators in the Social pillar, 62 indicators in the Environment pillar and 57 indicators in the Economy pillar.

Table 2: Vanuatu Headline Indicators under the NSDP M&E Framework



[3] Department of Strategic Policy, Planning and Aid Coordination, Ministry of the Prime Minister (2017)

3 Crisis Monitoring Indicators

According to the E/2021/33 CDP Report on 21 February 2021, together with all available data at that time, none of the graduating countries appear to be at risk of falling back into the LDC category. The Solomons Islands however remains highly vulnerable to economic and environmental shocks, as represented by its high economic and environmental vulnerability index score, which also faces challenges posed by the socioeconomic consequences of Covid19. The Committee recommends that development and trading partners support the country to diversify its economy, build disaster resilience and increase health security.

Annex 2 provides a list of potential indicators suggested for rigorous monitoring.

3.1 Macroeconomic

Economic growth in Vanuatu was negatively impacted from Tropical Cyclone Harold and Covid19, resulting in reductions in its gross domestic product, adding to an already low tax revenues and significant job losses in the tourism industry. Majority of the country's income was derived from tourism, remittances and ODA.

The gross national income (GNI) per capita is more than double the LDC graduation threshold, and the human assets index score remains high. The EVI score has improved, slowly. Nevertheless, Vanuatu needs to catchup with other developing countries in terms of productive capacity and its national accounting system needs further improvement. The key indicator that is currently monitored by CDP is GNI per capita.

3.2 Natural Disasters

Vanuatu is a set of volcanic islands, and has one of the highest rates of exposure to violent natural disasters[4]. According to a 2017 World Bank report, the impacts of natural disasters is estimated to be equivalent to an annualised loss of 6.6% of GDP in Vanuatu[5]. Tourism remains a leading economic pillar of structural progress, which in pre-Covid19 times would account for up to 54% of gross export earnings.

Under EVI there are 4 economic vulnerability indexes (1) share of agriculture, hunting, forestry and fishing; (2) remoteness (3) merchandise export concentration and (4) instability of exports of goods and services; and 4 environmental vulnerability indexes (5) share of population in low elevated coastal zones, (6) share of population living in drylands (7) instability of agricultural production and (8) victims of disasters. Additional indicators suggested for monitoring are in blue below.

[4] UN Conference on Trade and Development, Vulnerability profile of Vanuatu, March 2012

[5] World Bank IBRD (2017) "Long Term Economic Opportunities and Challenges for Pacific Island Countries"

3.3 Health

Press Releases related to health aspects of COVID19 preparedness and response are issued by Vanuatu's Ministry of Health as needed. In its latest Situation Report #57[6], dated 5 December 2021, two passengers who arrived into Vanuatu on a flight from New Caledonia on 22 October 2021 and were confirmed to have active COVID-19 infections are now both fully recovered. Therefore, as of 3 December 2021 Efate and Offshore Islands returned to Alert Level 0 (Low risk) due to no active cases. The whole of Vanuatu is therefore now at Alert Level 0. So far, 297,200 doses of COVID-19 vaccines have been received in Vanuatu, comprising 197,200 AstraZeneca doses and 100,000 Sinopharm doses. Vaccine roll-out has commenced in all six provinces. Vaccines are prioritised to health workers, front line workers (e.g. border workers, quarantine facility staff, public transport drivers), the elderly (55 and over), and people 35 and over with existing medical conditions.

Up until 5 December 2021, there were 147,595 COVID-19 doses administered in Vanuatu. A total of 100,264 people received at least one dose of AstraZeneca or Sinopharm and 47,345 people have received two doses of either Sinopharm or AstraZeneca and are considered fully vaccinated.

3.4 Other emergencies - Telecommunications and Energy

Vanuatu has a population of less than 300,000 people and well over 50% of its mobile connections still access 2G services. In addition, it is one of the most vulnerable places on earth in terms of natural disasters and a substantial number of its population do not have access to electricity. Despite this, telecoms services have progressed significantly in recent years with a liberalised market; the existence of two prominent mobile operators including Amalgamated Telecom Holdings (operating as TVL) and Digicel Vanuatu; the launch of LTE services and introduction of a rural satellite broadband service by Kacific.[7]

The Vanuatu telecommunications sector has continued to witness significant changes in 2020. With the uptake in mobile services and smartphones adoption, the increasing availability of 3G and 4G has stimulated access to data services as the two mobile operators continue to offer data promotions with increased value at affordable prices[8]. Some key highlights from the Sector report are:

- Mobile subscription decreased by 7% in 2020;
- **Mobile penetration fell to 84%;**
- Mobile data revenue grew by 20%;
- Mobile data downloads increased by 66% to 6,300 terabytes in 2020;
- Gross market revenue declined by 2%, however long run trend still shows positive growth as;
- Mobile data revenue continues to dominate the mobile market during this pandemic with increasing demand of online contents such as OTT services, E-Learning, Zoom Meeting platform, YouTube and Netflix which has gain popularity in this COVID-19 situation.[9]

[6] www.covid19.gov.vu

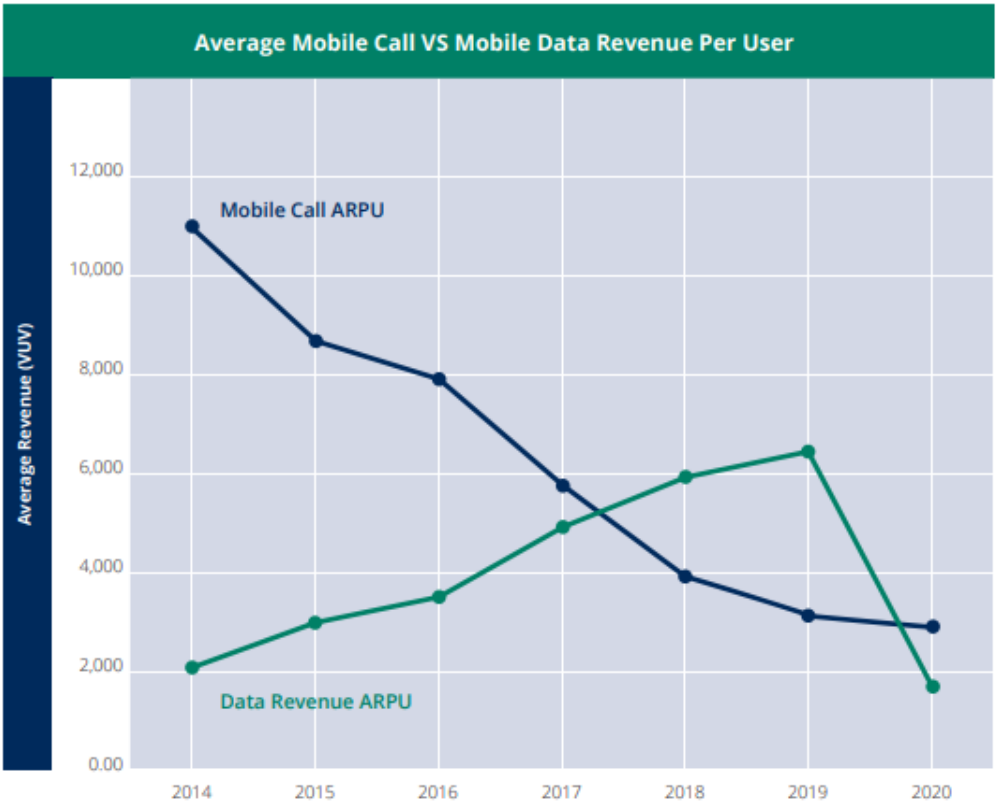
[7] Source: Business Wire

[8] Telecommunications, Radiocommunications and Broadcasting Regulator (TRBR), Telecommunications Sector Report. 2021.

[9] ibid

Figure 1 below illustrates that the average mobile call revenue per user has continued its downward trend, recording a lower revenue point of below VUV2,900 per user in 2020, whilst the data revenue recorded a sudden reduction in average revenue by 73% hitting VUV1,714 per user. This was due to the fact that both mobile operators responded to the COVID19 situation by offering data plans with huge value in terms of mobile data allowance at very low cost, and also offering a few 1GB packages at no cost, resulting in the drop in ARPU.[10]

Figure 1: Mobile Call ARPU vs Mobile Data ARPU[11]



4.0 Suggested Indicators for Crisis Monitoring

The suggested indicators provided in Table 3 below have been largely sourced from the Reserve Bank of Vanuatu's reports online. The attached excel files include raw data of the indicators. Annex 2 provides a list of potential indicators.

[10] ibid

[11] ibid, page 10.

Table 3. SUGGESTED INDICATORS FOR CRISIS MONITORING

Category		Name	Frequency	Measurement	Source	Threshold
Macroeconomic	1	CPI	Quarterly	• Annual change in CPI	Reserve Bank of Vanuatu	Above 4%
Macroeconomic	2	Foreign Reserves	Monthly	• Millions in USD	RBV	Below 4 months of cover
Macroeconomic	3	Tourism	Monthly	• Number of Visitor Arrivals	RBV	30% below the (pre-covid) 5yr average.
Macroeconomic	4	Kava exports	Monthly	• Millions in VATU	Vanuatu National Statistics Office	30% decline
Disasters	5	Volcanic hazard	Daily	• Seismic Monitoring • Visual and cameras • Satellite images - NOAA Satellite Picture and Information[12]	Vanuatu Meteorology & Geo-Hazards Department	
Disasters	6	Tropical cyclone	Ad hoc	• Wind speed and Category	Vanuatu Met Office	CAT 4 or CAT 5 Tropical Cyclone
Disasters	7	Drought / flooding	Monthly	• Rainfall levels	Vanuatu Climate Summary	Above-normal and below-normal agst the 30-year monthly average
Health and other emergencies	8	Covid confirmed cases	Daily	• Number of confirmed cases	Ministry of Health	Currently there are Zero cases. The threshold is based on the number of recent cases at the border, in the last 7 days.
Other emergencies	9	Average Revenue Per User (ARPU)	Daily	• Average Revenue (VUV)	Telco's	*As advised by TRBR.
Other emergencies	10	Energy consumption	Quarterly	• 000 Kwh / x 1000 Kwh	Reserve Bank of Vanuatu	30% above the 10-year average

[12] https://satepsanone.nesdis.noaa.gov/pub/OMI/OMISO2/vanuatu.html

MACROECONOMIC INDICATORS

Indicator 1: Inflation

Description:	The CPI is used to measure the changes in the prices of goods and services purchased by households in Port Vila and Luganville over a period of time. The separate indices for these two major commercial centers are then combined to create the Vanuatu CPI.
Justification:	The Reserve Bank of Vanuatu maintains that it is comfortable with inflation or the annual change in the CPI within the 0 to 4 percent range.
Frequency:	Quarterly
Measurement:	Annual change (%)
Source:	Reserve Bank of Vanuatu https://vnso.gov.vu/index.php/en/statistics-by-topic/cpi-news Vanuatu National Statistics Office https://vnso.gov.vu/index.php/en/statistics-by-topic/cpi-news
Thresholds:	Above 4%

Indicator 2: Foreign Reserves

Description:	The Reserve Bank of Vanuatu aims to maintain international foreign reserves at 'adequate' levels above a minimum threshold of 4 months of import cover.
Justification:	Relatively large foreign reserves are maintained because of the volatility of export earnings. The Vanuatu currency, Vatu has been fixed to a basket of currencies in 1998, and since 1981, fixed in relation to the SDR.
Frequency:	Monthly
Measurement:	Millions in USD
Source:	Reserve Bank of Vanuatu Quarterly Economic Reviews – latest published on March 2021 https://www.rbv.gov.vu/images/Quarterly-Economic-Reviews/2021/MARCH%202021%20QER.pdf
Thresholds:	Below 4 months of import cover

Indicator 3: Tourist arrivals

Description:	Tourism-related businesses were severely affected, continued to operate at reduced hours while a few businesses remained closed for a fourth consecutive quarter. Tourism marketing campaigns continue to target the domestic market.
Justification:	Pre-COVID19, the contribution of tourism arrivals on GDP (services) and tourism earnings remained significant to GDP. With Vanuatu's borders still closed, no visitor arrivals have been recorded since March 2020.
Frequency:	Monthly
Measurement:	Number of visitors
Source:	Vanuatu National Statistics Office https://vnso.gov.vu/index.php/en/statistics-by-topic/tourism
Thresholds:	30% below the (pre-covid) 5yr average.
Possible problems:	The impact of COVID19 in Vanuatu were quite significant, as tourism revenues were halted, remittances reduced and unemployment rose, undermining Vanuatu's growth. Impacts were compounded by Tropical Cyclone Harld, a category 5 storm that struck Vanuatu in April 2020.

Indicator 4: Kava exports

Description:	Kava is a root crop, popular in the Pacific Islands when mixed as a traditional drink. Its scientific name is piper methysticum. Bulk of kava is exported to Australia, New Caledonia, United States of America, Fiji, New Zealand and Kiribati. Kava exports to the global market had initially suffered, from the ban to Europe, however the Australian market has recently relaxed some of its import restrictions on kava.
Justification:	Kava is the major commodity that contributes to over 50% of main domestic products for export. Kava has increased its share substantially over the last 5 years. Other commodities from Vanuatu include copra (15%), coconut oil (8%), cocoa (6%), fish (5%), beef veal (2%), other products (10%).
Frequency:	Monthly
Measurement:	Millions in Vatu
Source:	Quarterly Economic Reviews, Table 29: Exports, page 79. Reserve Bank of Vanuatu https://www.rbv.gov.vu/index.php/en/research-publications International Merchandise Trade Statistics, Table 6, page 15 Vanuatu National Statistics Office https://vnso.gov.vu/index.php/en/statistics-by-topic/trade https://vnso.gov.vu/index.php/en/statistics-report/economic-statistics/international-merchandise-trade
Thresholds:	30% decline in the 10-year average exports

DISASTERS INDICATORS

Indicator 5: Volcanic hazard

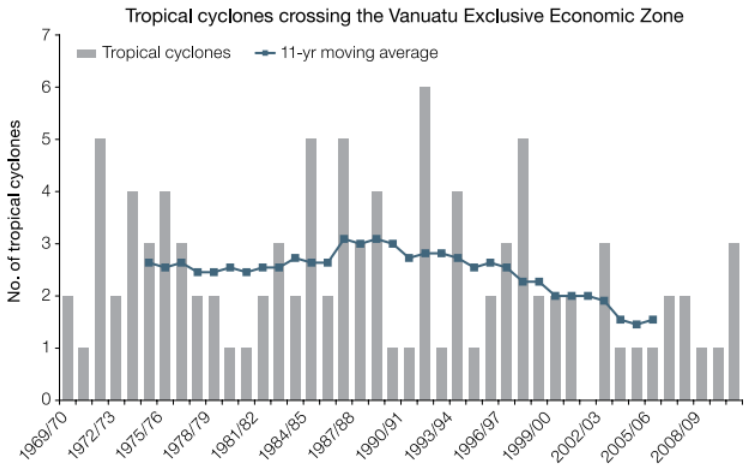
Description:	Vanuatu uses a system of Volcanic Alert Levels[13] to define the current status of each volcano. The alert levels range from 0 to 5, used to guide any appropriate response is as follows: Level 0 Normal; Level 1 Minor Volcanic Unrest – danger zone is near the volcanic area and the sulfur river; Level 2 Major Unrest; Level 3 Minor Eruption; Level 4 Moderate Eruption; Level 5 Very Large Eruption.
Justification:	Vanuatu has 6 active volcanos, which continue to be monitored closely by VMGD.[14] • Gaua volcano is at Level 2 since 31 January 2018. • Lopevi volcano remains at Level 2 since 23 September 2017. • Yasur volcano remains at Level 2 since 18 October 2016. • Ambae volcano remains at Level 1 since 5 December 2021. • Ambrym volcano remains at Level 1 since 10 October 2019. • Vanua Lava volcano is at Level 1 since 27 May 2016.
Frequency:	Monitored daily.
Measurement:	• Seismic Monitoring - Almost of all volcanoes in the world have some kind of seismic monitoring system and it is usually the first techniques applied when scientist begin to monitor a volcano. • Visual and cameras- The safety and cheapest way of monitoring a volcano is just to looking at it. • Satellite images - NOAA Satellite Picture and Information[15] (Ozone Monitoring Instrument) gives a daily flux of S02 & MODVOLC gives a near-real-time thermal monitoring of global volcanism using MODIS instrument
Source:	Vanuatu Meteorology & Geo-Hazards Department https://www.vmgd.gov.vu/vmgd/index.php/geohazards/volcano
Thresholds:	Movement of molten rock or magma beneath a volcano will occur before any eruption can start and this movement of magma is detectable using various methods described above.
Possible use of the indicators:	The type of volcanic hazards that will occur depend on which volcano is erupting (Gaua, Ambae, Ambrym, Lopevi or Tanna) and the nature of the eruption. For exemple volcanic hazards from an eruption from Gaua through the crater lake will be different from one at say Lopevi where there is no lake.

[13] https://www.vmgd.gov.vu/vmgd/index.php/geohazards/volcano/volcano-info/volcanic-alert-level
[14] https://www.vmgd.gov.vu/vmgd/index.php/geohazards/volcano/volcano-info/current-volcanic-activity
[15] https://satepsanone.nesdis.noaa.gov/pub/OMI/OMISO2/vanuatu.html

Indicator 6: Tropical cyclones

Description:	The number of tropical cyclones (TC) varies widely from year to year, with none in some seasons, but up to six in others, as per graph below. Wind speed levels of a tropical cyclone[16] are: • Category 1 Gale Force Winds: 90-125 km/h; • Category 2 Storm Force Winds: 125-164 km/h; • Category 3 Destructive Hurricane Force Winds: 165-224 km/h; • Category 4 Very destructive Hurricane Force Winds: 225-279km/h • Category 5 Catastrophic Hurricane Force Winds: more than 280km/h
Justification:	Vanuatu receives about 2-3 cyclones during the cyclone season, which starts from November to April of the following year, and the greatest frequency is between January and February. On average, Vanuatu and its marginal seas is a common route to some 20 to 30 cyclones per decade with 3 to 5 causing severe damage. TCs are tracked by Vanuatu Meteorological and Geohazards Department (VMGD) so that individuals can follow the position of the tropical cyclone. VMGD gives information on a tropical depression or tropical cyclone in three phases, namely Information, Advisory and Warning.
Frequency:	Ad hoc
Measurement:	Tropical Cyclone Category & Wind speed
Source:	Vanuatu Meteorological and Geohazards Department (VMGD) www.wmgd.gov.vu and www.facebook.com/vmgd.gov.vu
Thresholds:	Category 4 and Category 5 Tropical Cyclone – Wind speed reaches 200 km/h.

The graph below illustrates the Number of Tropical Cyclones developing within and crossing the Vanuatu Exclusive Economic Zone per season[17]. The 11-year moving average is in blue.



[16] Cyclone categories https://ndmo.gov.vu/fr/community/cyclone-awareness/149-cyclone-categories
[17] Pacific-Australia Climate Change Science and Adaptation Planning Program, https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/15_PACCSAP-Vanuatu-11pp_WEB.pdf

Indicator 7: Drought / Flooding

Description:	Droughts are common in Vanuatu and predicted to become more extensive as the change in weather patterns and climate changes intensifies. Rainfall in the wet season provide most of water supply to the smaller islands of Vanuatu, however El Nino conditions can shift rainfall patterns, causing significant decrease in rainfall and leading to drought conditions.
Justification:	In 2015, only six months after cyclone Pam, a category 5 Tropical Cyclone devastated Vanuatu, the country experienced a severe drought associated with a strong El Niño. This triggered issues on water and food shortage around the country especially in the cyclone affected areas.
Frequency:	Monthly
Measurement:	Monthly Barometric Pressure
Source:	Australian Government Bureau of Meteorology http://www.bom.gov.au/ntc/IDO70059/IDO70059BPD.shtml
Thresholds:	*TBC
Possible use of the indicators:	Agricultural drought is defined as a reduction in moisture availability below the optimum level required by a crop during different stages of its growth cycle, resulting in impaired growth and reduced yields.
Possible problems:	The worst period of drought in Vanuatu occurred in 1993. Floods are also common in Vanuatu and predicted to become as intense as droughts. Tropical cyclones and heavy rainfall are expected to become more intense and more frequent.

HEALTH AND OTHER EMERGENCIES INDICATORS

Indicator 8: Covid confirmed cases

Description:	In Vanuatu, from 3 January 2020 to 4:48pm CET, 10 December 2021, there have been 5 confirmed cases of COVID-19 with 0 deaths, reported to WHO. As of 27 November 2021, a total of 141,476 vaccine doses have been administered.
Justification:	Contact tracing can break the chains of transmission through the rapid identification of COVID19. Health departments are required to report cases of COVID19 to the Center for Disease Control and Prevention.
Frequency:	Daily
Measurement:	Per Individual
Source:	WHO Coronavirus (COVID-19) Dashboard https://covid19.who.int/region/wpro/country/vu
Thresholds:	New daily Covid death rates in the last 24 hours

OTHER EMERGENCY INDICATORS

Indicator 9: Average Revenue Per User (ARPU)

Description:	ARPU is a standard measure that the telecommunications industry uses to show the revenue generated across its customer base, for a given period.
Justification:	Mobile operators would report their consumer revenues for pre and post-pay, and corporate clients separately. While the data is published annually in the Vanuatu Telecommunications Sector Report, the data is collected on a *monthly* basis.
Frequency:	Monthly (TBC)
Measurement:	Average Revenue (VUV)
Source:	The Telecommunications Radiocommunications and Broadcasting Regulator (TRBR) is a statutory body operating independently from the government.
Thresholds:	*As advised by the TRBR
Possible use of the indicators:	Mobile operators have largely engaged with citizens and the Government for the provision of important services, ensuring continuity of access to mobile services and at the same time accommodating pressures on revenue and network capacity due to price reductions and changing consumer behavior during COVID19 and the impact of TC Harold.
Possible problems:	During a crisis, mobile networks can also be negatively impacted, as a result of network congestion, backup power supply, failure of grids, damage of towers, physical access to rural provinces and shortage of fuel. Lower mobile and/or data ARPU can translate into reduced consumer spending, and in turn, have a negative impact on GDP, at the height or during a crisis.

Indicator 10: Energy consumption

Description:	Energy consumption is the total energy consumed by end users, including residentials, industrial, transportation and agriculture sectors.
Justification:	Movements in electricity usage and energy consumption is regarded as an important indicator of economic development.
Frequency:	Quarterly
Measurement:	000 Kwh / x 1000 Kwh
Source:	Reserve Bank of Vanuatu Unelco Vanuatu Limited Vanuatu Utilities & Infrastructures Ltd Department of Customs
Thresholds:	30% above the 10-year average

ANNEX 1. LIST OF COUNTERPARTS AND GOVERNMENT CONTACTS

	Organisation	Contact Name	Contact Details	Sector
1	Central Bank of Solomon Islands	Mr. Luke Forau, Governor	Email: lforau@cbsi.com.sb Cell: (677) 7341673	Economic
2	Solomon Islands National Statistics Office	Mr Douglas Kimi Census Commissioner and Government Statistician	Email; dkimie@mof.gov.sb	Economic
4	Ministry of Health & Medical Service	Permanent Secretary Ms Pauline McNeil	Ph: (677) 28610	Health
5	Ministry of Environment, Climate Change, Disaster Management and Meteorology	Mr David Hiba Director, Solomon Islands Government Meteorological Service Division	Phone: (677) 20332 Fax: (677) 23029 Email: david.hiba@met.gov.sb	Disaster Management
6	Solomon Islands Chamber of Commerce and Industry	Ms. Natalina Hong Chief Executive Officer	Email: ceo@solomonchamber.com.sb	Economic
7	Ministry of Commerce, Industry, Labour and Immigration (MCILI)	Mr. Riley Mesepitu Permanent Secretary	Fax: (677) 25084 Mob: (677) 7496 745 Email: Riley.Mesepitu@commerce.gov.sb	Economic/Migration
8	Solomon Islands Red Cross Society	Ms Joanna Ramorii Tatalu Health manager, SIRC	Email: joannaramotalu17@gmail.com	Humanitarian
9	National Disaster Management Office (NDMO)	Loti Yates Director	Ph: (677) 27937 Cell: (677) 7932795 Email: directorndc@solomon.com.sb	Disaster Management
		George Baragamu Chief Operations Manager	Email: neoc@solomon.com.sb	

ANNEX 2 POTENTIAL INDICATORS FOR CRISIS MONITORING

Criteria	Indicators
Economic vulnerability	External conditions: • Crude oil prices - Bloomberg or Reuters - daily • Exchange rate stability (compared to the USD) • Budget deficits / government cashflow • Global market prices for selected commodities (gold, logs, palm oil, fish, coconut oil)
	Domestic conditions: • Domestic production • Debt % of GDP • Airline debt • Tax revenues
Environmental vulnerability	• Deaths caused by disasters • Buildings damaged • Estimated damage (US$ million)
	• Share of population in low elevated coastal zones • Extended power outages • Flood / drought (rainfall) • Sea water rising
Health index	• Hospital access - Number of ventilators per hospital ; Number of beds per hospital • Health professional: Skilled migration of clinical medical personnel (doctors and nurses)

Potential Indicator for HEALTH : Hospital access

Description:	Hospital beds per capita, relative to a maximum threshold of 18 per 10,000 population. Numerator: Number of hospital beds (excluding labour and delivery beds) Denominator: Total population
Justification:	Access to health services is important for promoting and maintaining health, preventing and managing disease, reducing unnecessary death. Hospital beds are used to indicate the availability of inpatient services. There is no global norm for the density of hospital beds in relation to total population.
Frequency:	According to the 2017 Annual Report for the Ministry of Health and Medical Services, the Average Monthly reporting coverage was maintained at 90%,
Measurement:	Per 10,000 population
Source:	The Medical Statistics Unit of the Ministry of Health and Medical Services of Solomon Islands (see Annual Report 2017) https://unstats.un.org/sdgs/metadata/files/Metadata-03-08-01.pdf
Thresholds:	Using available data, the indicator is computed relative to a threshold value of 18 hospital beds per 10,000 population. This threshold is below the observed OECD high income country minimum (since year 2000) of 20 per 10,000 and tends to correspond to an inpatient hospital admission rate of around 5 per 100 per year. The indicator is computed as follows, using country data on hospital bed density (x), which results in values ranging from 0 to 100: ● Country with a hospital bed density x < 18 per 10,000 per year, the indicator = x /18*100. ● Country with a hospital bed density x >= 18 per 10,000 per year, the indicator = 100.
Possible use of the indicators:	This indicator is designed to capture low levels of hospital capacity; the maximum threshold is used because very high hospital bed densities are not necessarily an efficient use of resources.
Possible problems:	An alternative indicator could be hospital in-patient admission rate, relative to a maximum threshold. However, that indicator is currently not reported widely across regions. In countries where both hospital beds per capita and in-patient admission rates are available, they are highly correlated.

Potential Indicator for HEALTH: Health workforce

Description:	Health professionals (physicians, psychiatrists, and surgeons) per capita, relative to maximum thresholds for each cadre (partial overlap with SDG indicator 3.c.1, see metadata here)
Justification:	Patient access is the first point of contact for patients and staff to manage and deliver quality health care services.
Frequency:	TBC
Measurement:	Per person.
Source:	District Health Information System (DHIS2), which is the central mechanism for data storage and management, which was implemented in 2011. Provincial HR records
Thresholds:	Health clinical staff per 10,000