BRIDGING CLIMATE FINANCE AND DEBT SUSTAINABILITY IN GLOBAL VULNERABLE COUNTRIES (GVC)

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ABSTRACT

After decade of aspiring to fulfill sustainability ambitions, we are still facing a polycrisis of complex and intertwined global economic, social and environmental challenges. Specifically, climate – related challenges (stemming from both acute and chronic risks) are responsible for a series of macroeconomic shocks which (by inducing economic disruptions and fiscal pressures) directly affect a country's fiscal space and debt sustainability. Consequently, Global Vulnerable Countries (GVCs) will have to face higher borrowing needs and costs which can result in heightened refinancing risks and fiscal space reduction. Regrettably, this will result in fewer resources being available to fund adaptation and mitigation policies to reduce potential climate vulnerabilities. In fact, this also increases the probability of default of the GVCs and can feed into the climate Crisis – Sovereign Debt Doom Cycle. Therefore, this paper argued that Debt for – Climate – Swaps (DFCS) could unlock direct funding for climate – related spending to break the negative cycle. Fundamentally, DFCS can free up fiscal space beyond the direct savings generated by the debt swap by enhancing governments' repayment capacity is well as lowering borrowing costs often linked to debt distress situation. However, policy action at both global and national levels is needed to foster a more favorable external environment as well as enhancing macroeconomic stability with reduced structural constraints to accelerate long term growth and development of those vulnerable countries. In other words, for these actions, global coordination and cooperation will be critical and useful.

Keywords: Debt, Sustainability, Climate Change, Climate finance, Vulnerability, Green Swaps, Debt Swaps, Poverty, Polycrisis environment, development.

JEL NO: F30, F31, F32, F33, F34, F35, 601, 615, Q50, Q54

1.0 INTRODUCTION

In contrast to the conventional description of Northern hemisphere and southern hemisphere; global north consists of the world's developed countries while global south consists of world's developing countries including least developed countries. Notably, global north and global south are usually referred in terms of their differing levels of wealth, economic development, income inequality, strength of democracy and variety of freedom indices.

In other words, countries of the global north tend to be wealthier (and capable of exporting technologically advanced manufactured products) while global south countries tend to be poorer and heavily dependent on their largely agrarian – based economic sectors (Therien, 1999; UNCTAD, 2023; Collier, 2015). Specifically global south's countries are commonly identified as lacking in their standard of living which includes having lower incomes, high levels of poverty, high population rates, inadequate housing limited educational opportunities as well as inadequate health systems. Spatially, the global south countries comprise Africa, Latin America, Caribbean, Asia (excluding Israel, Japan and South Korea) and Oceania (excluding Australia and New Zealand). Unfortunately, the global crisis (of past decades) have hitted hard on several global south countries eligible for grants and low – interest loans from World Bank's International Development Association (IDA). In fact, development is reversing in a major way in these countries (which are among the poorest and most vulnerable in the world). And as a group, they have been struggling through their weakest half decade of growth (since early 1990s). Specifically, on the eve of the Covid – 19 pandemic, significant development gaps persisted, and convergence of the IDA country incomes with those of the advanced economies was showing while some vulnerability were rising (World Bank, 2024). Notably, the shock of the pandemic and subsequent overlapping crises has exacerbated the challenges facing these vulnerable economies and thus led to reversal in development. Regrettably, between 2020 and 2025, per capita incomes in some of the vulnerable countries have been growing more slowly than those of wealthy economies.

In other words, most vulnerable countries are now poorer than it was in the eve of the pandemic. Thus, poverty remains extremely high and hunger has surged (amid fiscal constraints and rising investment needs). Yet, as the world exists the first quarter of the

twenty – first century; the primary challenge for vulnerable countries is to realign developmental goals that have been derailed by large negative shocks since COVID (pandemic) period which came on the heels of a decade of slowing progress. Furthermore, in an environment of elevated policy uncertainty (inclusive of relations to possible post – election policy shifts) global vulnerable countries (GVCs) need to calibrate their policies to mitigate the growth – dampening effects of uncertainty. Certainly, this will require navigating difficult external environment and comprehensive set of reforms to sustainably boost GVC growth along several dimensions.

Regrettably, GVCs are vulnerable to debt distress especially following the sharp rise in debt levels and borrowing costs in recent years. Specifically, relative to 2019 levels, government debt is higher in all global vulnerable countries and significant number face weaker fiscal positions including higher levels of external debt (World Bank, 2025). Clearly, the observed debt building raises concern about its potential consequences for macro-economic and financial stability. In fact, sovereign debt defaults are typically associated with large output losses, sharp increase in borrowing costs, exclusion from international capital markets as well as trade and financial system disruptions. Furthermore, debt defaults can inflict substantial social costs (including those related to the incidence of poverty, life expectancy, infant mortality and malnutrition) in those vulnerable countries. Notably, these countries are home to one – quarter of humanity (representing a large slice of the young people who will enter the global workforce in the next decade). Yet global policy makers have opted to tempt fate by betting that global growth will accelerate while interest rates will fall significantly to defuse debt bomb.

However, it has been extremely difficult to devise a dependable system capable of ensuring global debt sustainability and swift debt restricting for GVCs that need it. Thus, in the absence of such a system, the progress that has occurred has been too slow to avoid rising debt dangers. But these vulnerable countries cannot afford another decade of drift and denial (where debt is concerned). Unfortunately, under current policies, global growth will not speed up soon and which implies that sovereign debt-to-GDP ratios are likely to climb further. Although fiscal consolidation efforts are beginning to yield results in some of these countries,

more comprehensive reform are needed to build long – term resilience. Therefore, our research study offers a critical platform to explore innovative financial solutions that align debt management with broader development objectives of green transition.

Notably, exposure to multi-crisis to shocks does not actually mean that GVCs are at risk. Rather, the extent of risk depends on how vulnerable countries are to be harmed by these shocks (if they occur). That is, the degree of risk is determined by exposure and vulnerability which is an indication of the extent of these countries exposure to those risks as well as the degree to which they are vulnerable to suffering damages (as affected).

Therefore, decisive policy actions are needed to address developing risks and avoiding debt crisis that may bring sizeable economic and social costs. In fact, in the absence of such actions, potential debt defaults in those vulnerable countries (at high risk) could severely undermine progress on development goals and green transition with major global implications. Consequently, this research study focuses on sixty – four vulnerable countries as a group (while acknowledging considerable economic diversity among them). The rest of the paper is divided into seven sections. Section two provides an overview of the global vulnerable countries. Section three presents environmental sustainability frameworks while section four discusses debt sustainability frameworks. Furthermore, climate finance frameworks are explored in section five while section six analyzes green and swap options. In section seven, we discuss policy challenges while section eight concluded the paper as appropriate.

2.0 GLOBAL VULNERABLE COUNTRIES (GVC)

For sake of proper identification, global vulnerable countries (GVC) can be defined as those low income countries (LICs) and lower middle income countries (LMCs) that are eligible for grants and low – interest loans from International Development Association (IDA) as well as being eligible for borrowing under the Poverty Reduction and Growth Trust (PRGT). Clearly, each vulnerable country is unique and yet many share common characteristics that tend to hinder their development efforts and increase their vulnerability to shocks. Technically, GVCs can be segmented across several dimensions as listed below (World Bank, 2024, 2025, IMF, 2025):

I. Vulnerable countries at or below IDA cutoff threshold of GNI per capita (US$ 1,335) referred to as the poorest LICS;

II. Vulnerable countries above the IDA cutoff threshold, often referred to as LMCs

III. Fragile and conflict affected states (FCS) that experience political instability, flows of displaced people or open conflict situations;

IV. Small and developing states (SDS) with lower levels of population;

V. And tourism dependent countries whose export earnings are significantly smaller

Notably, most vulnerable countries have low income levels as shown in tables (2.1). In other words, GVCs have low per capita incomes and high rates of extreme poverty. In fact, they account for significant portion of the global population but contributing only a small fraction to global output as shown in table 2.2 (World Bank, 2024B).unfortunately, many vulnerable countries are in sub – Saharan African, where most of the world's powers reside.

TABLE 2.1: GLOBAL VULNERABLE COUNTRIES: STATUS AND CHARACTERISTICS

S/N	COUNTRIES	CODES	INCOME STATUS	REGIONAL CLASSIFICATION	GDP PER CAPITA (CURRENT PRICES)	CURRENCY UNITS	GDP PER CAPITA (RANKING)
A	B	C	D	E	F	G	H
V1	AFGHANISTAN	AFG	LIC	SOUTH ASIA	$409.006	AFN=100P	-
V2	BANBLADESH	BGD	LMC	SOUTH ASIA	$2689.241	TK=100P	$02.70K
V3	BENIN	BEN	LMC	WEST AFRICA	$1531.868	FRANC CFA	$01.50K
V4	BHUTAN	BTN	LMC	SOUTH ASIA	$4302.305	NQUL = 100C	-
V5	BURKINA FASO	BFA	LIC	WEST AFRICA	$1106.535	FRANC CFA	$01.10K
V6	BURUNDI	BOI	LIC	EAST AFRICA	$489.941	FRANCK = 100C	$00.50K
V7	CAPE VERDE	CPV	LMC	WEST AFRICA	$5421.138	ESCUDO = 100C	-
V8	CAMBODIA	KHM	LMC	CENTRAL AFRICA	$2869.650	RIEL = 100 SEN	$02.96K
V9	CAMEROON	CMR	LMC	CENTRAL AFRICA	$1865.064	FRANC CFA	$01.90K
V10	CENTRAL AFRICAN REPUBLIC	CAP	LIC	CENTRAL AFRICA	$531.757	FRANC CFA	$00.50K
V11	CHAD	TCD	LIC	EAST AFRICA	$991.084	FRANC CFA	$01.50K
V12	COMOROS	COM	LMC	CENTRAL AFRICA	$1701.519	FRANC CFA	$01.00K
V13	CONGO DEM REP	COD	LIC	CENTRAL AFRICA	$742.54	FRANC CFA	$00.70K
V14	CONGO,	COG	LMC	WEST AFRICA	$2355.902	FRANC CFA	$02.40K
V15	COTE D'IVOIRE	CIV	LMC	SOUTHERN AFRICA	$2872.045	FRANC CFA	$02.90K
V16	DJIBOUTI	DJI	LMC	EAST AFRICA	$4343.352	DFRANC = 100C	-
V17	ERITREA	ERI	LIC	WEST AFRICA	-	NAKFA(ERN)	-
V18	ETHIOPIA	ETH	LIC	WEST AFRICA	$32760.31	ETB = 100C	$01.10K
V19	GAMBIA	GMB	LIC	WEST AFRICA	$987.643	D= 100B	$01.00K
V20	GHANA	GHA	LMC	WEST AFRICA	$2519.144	CEDI = 100P	$02.50K

V21	GUINEA	GIN	LMC	WEST AFRICA	$1904.336	GFRAN = 100 CENT	$01.90
V22	GUINEA – BISSAU	GNB	LIC	CENTRAL AMERICA	$1126.259	PESO =100C	$01.10K
V23	HAITI	HTT	LMC	CENTRAL AMERICA	$2671.65	GOARDE =100C	$02.70K
V24	HONDURAS	HND	LMC	EAST AFRICA	$3519.256	LEMPIRA =100C	-
V25	KENYA	KEN	LMC	EAST ASIA	$2467.923	KSH =100C	$02.50K
V26	BIRIBATI	KIR	LMC	EAST ASIA	$2414.191	SA = 100C	$02.40K
V27	KYRGYZ REPUBLIC	KGZ	LMC	CENTRAL ASIA	$2746.617	ROUBLE = 100K	$02.70
V28	LAO PDR	LAO	LMC	EAST ASIA	$2095.808	KIP = 100a	$02.10k
V29	LESOTHO	LSO	LMC	EAST AFRICA	$1097.840	LOT I = 100L	$01.10k
V30	LIBERIA	LBR	LIC	WEST AFRICA	$907.636	L $ = 100C	$00.90k
V31	MADA GASCAR	MDG	LIC	EAST AFRICA	$594.938	FMG =100C	$00.60k
V32	MALAWI	MWI	LIC	EAST AFRICA	$580.245	KWACHA = 100t	$00.60k
V33	MALI	MLT	LIC	WEST AFRICA	$936.158	FRANC CFA	$00.90K
V34	MAURITANIA	MRT	LMC	WEST AFRICA	$2477.849	UM = 5KHOUMS	$02.50K
V35	MICRONESIA FEDSB	STS	LMC	EAST ASIA	$5290.934	US(DOLLAR)	-
V36	MOZAMBIQUE	MOZ	LIC	EAST AFRICA	$663.340	MT = 100C	$00.70K
V37	MYANMAR (BURMA)	MMR	LMC	SOUTH EAST ASIA	$1176.908	MMK(MVANMARKYAT)	$01.20K
V38	NEPAL	NPL	LMC	SOUTH ASIA	$1457.911	RUPEE = 100P	$01.50K
V39	NICRAGUA	NPL	LMC	CENTRAL AMERICA	$3019.105	C $ = 100C	-
V40	NIGER	NER	LIC	WEST AFRICA	$751.037	FRANC CFA	$00.80K
V41	NIGERIA	NGA	LMC	WEST AFRICA	$806.841	# NAIRA = 100 KOBO	$00.8aK
V42	PAKISTAN	PAK	LMC	SOUTH ASIA	$1581.174	PRUPEE=100P	_____
V43	PAPUANEW GUINEA	PNG	LMC	EAST ASIA	$2524.370	KINA=100E	$02.60

V44	RWANDA	RWA	LIC	EAST AFRICA	$1042.998	RWF =100C	$01.00K
V45	SAMOA	SMR	LMC	EAST ASIA	$5470.826	WST (TALA)	-
V46	SAOTOME AND PRINCIPLE	STP	LMC	CENTRAL AFRICA	$3569.430	DUBRA = 100P	-
V47	SENEGAL	SEN	LMC	WEST AFRICA	$1811.269	FRANC CFA	$01.80K
V48	SIERRA LEONE	SLE	`LIC	WEST AFRICA	$915.81	LEUNE = 100	$00.90K
V49	SOLOMON ISLANDS	SLB	LMC	EAST ASIA	$2378.548	SI$ = 100	$02.40K
V50	SOMALIA	SOM	LIC	EAST AFRICA	$766.013	SOMALI = 100C	$00.80K
V51	SOUTH SUDAN	SSD	LIC	EAST AFRICA	$251.485	SSP = 100P	$00.30K
V52	SRILANKA	LKA	LMC	SOUTH ASIA	$4324.872	RUPEE = 1000 CENTS	-
V53	SUDAN	SDN	LIC	EAST AFRICA	$624.899	SD = 10 POUNDS	$00.60K
V54	SYRIAN ARAB REPUBLIC	SYR	LIC	EAST ASIA	-	S $ = 100P	-
V55	TAJIKISTAN	TJK	LMC	CENTRAL ASIA	1432.039	ROUBLE = 100K	$01.40K
V56	TANZANIA	TZA	LMC	EAST AFRICA	$1279.893	TSHILLING = 100C	$01.30K
V57	TIMOR LESTE	TLS	LMC	CENTRAL ASIA	$1491.288	US DOLLAR	$01.50K
V58	TOGO	TGO	LIC	WEST AFRICA	$1053.388	FRANC CFA	$01.10K
V59	UGANDA	UGA	LIC	EAST AFRICA	$1338.497	USHILLING = 100C	$01.30K
V60	UZBEKISTAN	UZB	LMC	CENTRAL ASIA	$2514.064	ROUBLE – 100K	-
V61	VANUATU	VUT	LMC	EAST AFRICA	$4068.087	VATU = 100Z	-
V62	YEMEN, REP	YEM	LIC	EAST ASIA	$416.553	VD = 100 FILS	$00.40K
V63	ZAMBIA	ZMR	LMC	SOUTHERN AFRICA	$1331.843	K = 100 NGWE	$01.30K
V64	ZIMBABWE	ZWE	LMC	SOUTHERN AFRICA	$2198.842	Z D = 100C	$02.20K

SOURCES: World Bank (2025A) World Development Indicators World Atlas (2025). Poorest Countries World Bank (2025b). Global Economic Prospects IMF (2025A) Macro

economic Developments Visual Capitalist (2025). World Bank (2024) Great Reversal NWAOBI (2000). The Knowledge Economics.

Notes:

GDP = Gross Domestic Product (Per capita)

LIC = Low Income Countries

LMC = Lower Middle Income Countries

AFGHANISTAN = GDP PER CAPITA (2023)

ALL COUNTRIES = GLOBAL SOUTH COUNTRIES

GDP PER CAPITA = Expressed in dollars

and with world average of $14.2k or $14,213 in year 2025.

GDP PER CAPITA DATA FOR AFGHANISTAN = YEAR 2024

GDP PER CAPITA DATA FOR PAKISTAN = YEAR 2024

GDP PER CAPITA DATA FOR SRILANKA = YEAR 2024

TABLE 2.2: GLOBAL CLASSIFICATIONS COMPARATIVE INDICATORS

INCOME CLASSIFICATION	**GLOBAL POPULATION SHARES**	**GLOBAL GDP SHARES**	**GLOBAL EXTREME POVERTY SHARES**
	(%)	(%)	(%)
LOW INCOME	98.90	00.60	36.50
LOWER MIDDLE INCOME	40,30	08.30	55.40
UPPER MIDDLE INCOME	35.10	30.30	07.10
HIGH INCOME	15.70	60.80	01.00

Indeed, vulnerable countries have suffered substantial losses in output relative to pre-pandemic trends. However, as shown in table 2.3, the recovery is projected or forecasted to remain weaker than that in previous post recession rebounds (including the recovery from the past global recession) and also weaker than that of other developing economies. Again, compounding effects of the unusual overlapping crisis of recent years alongside longer – term scarring from the pandemic largely account for the weakness of the recovery from the 2020 global recession relative to earlier recoveries. Notably, weak debt vulnerabilities, exposure to financial disruptions and high dependence on energy and other commodity exports exposed many vulnerable countries (heavily) to the pandemic impact. Unfortunately, GVCs growth will remain insufficient to tackle key development challenges; with the pace of reduction in extreme poverty slowing and lagging established goals. In other words, the pandemic reversed about three years of progress in reducing extreme poverty in vulnerable countries. Thus, projected

TABLE 2.3: GLOBAL VULNERABLE COUNTRIES: REAL GDP GROWTH RATES (%)

S/N	COUNTRIES	2017	2018	2019	2020	2021	2022	20323	2024	2025	2025
A	B	C	D	E	F	G	H	I	J	K	L
V1	AFGHANISTAN	02.70	01.80	02.90	-05.50	01.00	-06.20	02.70	-	-	-
V2	BANBLADESH	07.30	07.90	08.20	01.60	01.00	07.10	05.80	05.00	04.10	05.40
V3	BENIN	05.80	06.70	06.90	03.20	06.00	06.30	06.40	06.30	06.40	06.30
V4	BHUTAN	06.30	03.80	03.90	01.50	01.60	04.80	05.00	05.30	07.20	06.60
V5	BURKINA FASO	06.30	06.80	05.70	02.00	05.80	01.50	03.00	03.70	03.90	04.10
V6	BURUNDI	00.50	01.60	01.80	01.00	02.30	01.80	02.70	02.20	03.50	04.20
V7	CAPE VERDE	03.70	05.10	05.50	-05.50	05.50	17.40	05.10	05.20	04.90	04.80
V8	CAMBODIA	07.00	07.50	07.10	-01.00	06.00	05.10	05.00	05.30	05.50	05.50
V9	CAMEROON	03.50	04.10	03.90	-0.20	03.40	03.60	03.30	03.70	04.00	04.20
V10	CENTRAL AFRICAN REPUBLIC	0.4.50	03.70	03.10	00.80	03.50	05.50	00.70	00.70	01.10	02.00
V11	CHAD	-03.00	02.60	03.20	-00.20	04.70	02.80	04.20	03.00	02.10	03.50
V12	COMOROS	03.80	03.40	01.90	-01.40	03.20	02.80	03.00	03.50	04.00	04.30
V13	CONGO DEM REP	03.70	05.80	04.40	-02.20	03.50	08.90	08.40	04.90	05.00	04.60
V14	CONGO REP	-01.80	01.60	-00.90	-0.6.20	-01.10	01.50	01.90	02.10	03.50	03.30
V15	COTE D'IVOIRE	07.40	06.80	06.90	02.70	08.70	06.20	06.20	06.50	06.40	06.60
V16	DJIBOUTI	05.40	08.40	07.50	01.30	09.20	03.70	06.70	05.90	05.30	04.90
V17	ERITREA	-10.00	13.00	03.70	-00.70	05.70	02.50	02.60	02.80	03.00	03.30
V18	ETHIOPIA	10.00	07.90	09.00	03.20	03.60	06.40	07.20	06.10	06.50	07.10
V19	GAMBIA	04.80	06.60	06.00	02.50	06.50	04.90	05.30	05.60	05.80	05.40
V20	GHANA	08.10	06.30	06.50	01.50	03.40	03.80	02.90	04.00	04.20	04.90
V21	GUINEA	10.30	06.20	05.60	02.10	07.90	04.00	06.70	05.30	06.00	06.40
V22	GUINEA – BISSAU	05.90	03.80	04.70	-01.60	03.10	04.20	05.20	05.00	05.00	05.00

V23	HAITI	-01.20	01.50	-00.90	-03.50	01.00	-01.70	-01.90	-04.20	00.50	01.50
V24	HONDURAS	04.80	03.70	02.70	-05.80	03.70	04.10	03.60	03.70	03.60	03.60
V25	KENYA	04.80	06.30	05.40	01.50	05.20	04.90	05.60	04.70	05.00	05.10
V26	BIRIBATI	-	-	-	-	-	-	-	-	-	-
V27	KYRGYZ REPUBLIC	04.70	03.80	04.50	-04.00	05.60	09.00	06.20	05.80	04.50	04.50
V28	LAO PDR	06.90	06.30	04.70	01.00	04.60	02.70	03.70	04.10	03.70	03.70
V29	LESOTHO	-0.40	01.50	01.40	-05.10	05.50	01.30	00.90	02.50	02.30	02.00
V30	LIBERIA	02.50	01.20	-02.30	-02.60	04.00	04.80	04.70	05.30	05.70	05.80
V31	MADA GASCAR	03.90	04.60	04.80	-01.20	04.00	04.00	03.80	04.50	04.60	04.70
V32	MALAWI	04.00	03.50	04.40	02.00	03.50	00.90	01.60	01.80	04.20	03.30
V33	MALI	05.30	04.70	05.10	00.90	04.00	03.50	03.50	03.70	04.00	04.50
V34	MAURITANIA	03.00	03.60	06.30	-02.00	04.20	06.80	06.50	06.50	07.80	07.50
V35	MICRONESIA FED SIS	-	-	-	-	-	-	-	-	-	-
V36	MOZAMBIQUE	03.70	03.40	02.20	01.30	03.60	04.40	05.40	04.00	04.00	04.00
V37	MYANMAR (BURMA)	06.20	06.80	06.30	01.50	06.00	04.00	01.00	-01.00	02.00	-
V38	NEPAL	08.20	06.70	07.00	01.80	02.10	05.60	02.00	03.90	05.10	05.50
V39	NICRA GUA	04.60	-04.00	-03.90	-06.30	00.70	03.80	04.60	03.60	03.50	03.60
V40	NIGER	04.90	06.50	06.30	01.00	08.10	11.50	02.00	05.70	08.50	04.60
V41	NIGERIA	00.80	01.90	02.20	-03.20	01.70	03.30	02.90	03.30	03.50	03.70
V42	PAKISTAN	05.20	05.50	01.90	-02.60	-00.20	06.20	-00.20	02.50	02.80	03.20
V43	PAPUA NEW GUINEA	03.50	-00.80	06.00	-01.30	03.40	05.70	03.00	04.50	04.60	03.50
V44	RWANDA	06.10	08.60	09.40	02.00	06.90	08.20	08.20	07.60	07.80	07.50
V45	SAMOA	-	-	-	-	-	-05.40	09.20	09.40	05.50	02.80
V46	SAO TOME AND PRINCIPLE	03.90	02.70	02.40	-09.50	06.10	00.20	00.40	01.10	03.30	03.60
V47	SENEGAL	07.40	06.40	05.30	01.30	04.00	03.80	04.60	06.10	09.70	06.00

V48	SIERRA LEONE	03.80	03.50	05.10	-02.30	04.00	05.30	05.70	04.30	04.70	04.70
V49	SOLOMON ISLANDS	03.70	03.90	02.70	-06.70	-0.30	02.30	03.00	02.50	02.90	02.90
V50	SOMALIA	-	-	-	-	-	02.70	04.20	04.40	04.50	04.50
V51	SOUTH SUDAN	-06.90	-03.50	03.20	-04.30	-23.60	-02.30	-01.30	-07.80	-11.40	06.10
V52	SRI LANKA	03.60	03.30	02.30	-03.20	00.00	-07.30	-02.30	04.40	03.50	03.10
V53	SUDAN	04.30	-02.30	-02.60	-04.00	00.50	-01.00	-20.10	-15.10	01.30	02.90
V54	SYRIAN ARAB REPUBLIC	-	-	-	-	-	-	-	-	-	-
V55	TAJIKISTAN	07.60	07.30	07.50	-02.00	03.70	08.00	08.00	08.30	06.00	05.00
V56	TANZANIA	06.80	05.40	05.80	02.50	05.50	04.60	05.10	05.40	05.80	06.20
V57	TIMOR LESTE	-03.80	-00.80	03.40	-04.80	03.80	04.00	02.30	03.50	03.40	03.60
V58	TOGO	04.40	04.90	05.30	01.00	04.00	05.80	06.40	05.30	05.40	05.80
V59	UGANDA	03.90	06.20	06.50	03.30	03.70	04.70	05.30	06.00	06.20	10.80
V60	UZBEKISTAN	04.50	05.40	05.60	01.50	06.60	06.00	06.30			
V61	VANUATU	-	-	-	-	-	-	-	-	-	-
V62	YEMEN, REP	-	-	-	-	-	-	-	-	-	-
V63	ZAMBIA	03.40	04.00	01.70	-0.80	02.40	05.20	05.40	01.20	06.20	06.00
V64	ZIMBABWE	04.70	03.50	-08.10	-10.00	02.90	06.10	05.30	02.00	06.20	04.80

Sources:

WORLD Bank (2025B)

World Bank (2025A)

IMF (2024)

NOTES:

YEAR 2019 = ESTIMATED RATES

YEAR 2020 = FORCASTED RATES

YEAR 2021 = FORCASTED RATES

near time growth will be insufficient to enable GVC countries to make major progress in reducing poverty (World Bank, 2024C, WU et al., 2024).

Yet, even if growth exceeds expectations, it is likely to pass through only in a relatively muted way to household consumption expenditures in many vulnerable countries (such as those in sub – Saharan Africa) stifling any potential boost to household welfare and poverty reduction. Clearly, in absolute terms, more people are now living in extreme poverty in GVCs than in 1990 while progress reducing that number over the remainder of the decade is expected to be modest. In other words, the number of people living in extreme poverty has remained stubbornly high in the said regions. Again, the erosion in per capita incomes since 2020 in the most vulnerable economies reflects myriad factors such as intensifying conflict and violence, political instability, food and energy price shocks, limited access to financing as well as elevated debt. Then, following successive negative growth surprises; GVCs are now projected to experience weaker recoveries in per capita incomes than previously assumed (World Bank, 2025B). Furthermore, heightened vulnerabilities attributable to institutional fragility, social unrest and conflict characterize many GVCs.

Critically, vulnerability to natural disasters (especially those related to climate change) is a pressing concern for vulnerable countries. In particular, climate change poses growing threats to lives, livelihood's and economic stability to these countries (Jafino, et al. 2020).

In fact, because of climate change, natural disasters are increasing in frequency and Severity (worldwide) while people in GVCS are bearing brunt of extreme wealthier events. .

In fact, because of climate change, natural disasters are increasing in frequency and severity globally; with people is a vulnerable country bearing the brunt of extreme weather events. Clearly, these countries sustain substantial economic losses from natural disasters that have risen significantly over time. Regrettably, these economies (often with limited resources) are particularly vulnerable to the effects of ultimate change such as drought, floors and rising sea levels. Similarly, climate change disproportionately affects the agricultural sector that is crucial for many vulnerable countries. And beyond economic loses, extreme weather events can significantly affect food security and livelihoods in GVCs.

Generally, vulnerable countries have weaker institutions than other economies. Basically, this institutional weakness is broad in scope (inclusive of tenuous legal capacity for protecting property rights, persistence of political violence, state and market failures, weak governance and corruption). Here, the presence of important natural resource endowments in these vulnerable countries (as a potential boom) can impede economic diversification corruption and conflict. Surely, these issues heighten country risk profiles as well as hindering capital inflows. Similarly, limited institutional capacity also affects data availability and quality which complicates policy design and implementation. Again, in a typical vulnerable country, widespread informality constrains efforts to mobilize government revenue which (in turn) hampers government capacity to deliver key public services. Therefore, spending on critical sectors like health and education remains lower than is obtainable in developed economies.

Financially, in many GVCs, sizable and persistent twin (fiscal and current account) deficits prevail. Thus, elevated levels of debt often accompany these deficits. As a response, these countries rely heavily on external sources (such as remittances) to meet their financing needs. Similarly, they tend to have underdeveloped domestic financial sectors with limited capacity for conducting basic intermediation transactions linking assets and borrowers. Consequently, shallow and illiquid financial systems (lacking diverse in instruments) leave those vulnerable countries ill-equipped to absorb and mitigate the impact of adverse shocks.

Indeed, GVCs are at a risk of a cost decade of development. Clearly the over- lapping crises of recent years have caused progress toward key development objectives in vulnerable countries to come to a halt (or even reverse). Then, with heightened vulnerabilities and limited buffers to respond; GVCs are particularly exposed assuming key risks (beyond their control) materialize. Indisputably, this could lead to further instability, increased fiscal pressures and under investment which in turn undermines longer-term growth and development prospects. However, worsening conflict and violence could undermine growth and impede development progress. In other words, further escalations could intensify political instability, deepen food insecurity, divert scarce government resources away from growth

enhancing areas and undermine investment prospects. That is weaker growth and development outcomes would occur.

Fundamentally, a country is vulnerable in the economic domain if the extent to which its economy can act as a pillar of resilience in the face of external shocks is compromised. Therefore, it is anticipated that GVCs with more vulnerable employment and inequalities (card with less access to foreign direct investment inflows) will be more vulnerable in the economic dimension towards external shocks.

However, there are four dimensions in which the interconnectivity of those vulnerable countries and their connectivity to the rest of the world can Cause them to be vulnerable to shocks that can restrict the flow of goods and service (inclusive of ideas and labor). Basically, these dimensions include trade and transport costs, logistical services, shipping and ICT as well as digital connectivity. Yet, with regard to social vulnerability (the boarder conditions in which people are born, live, work and age) can worsen an unfortunate event into a veritable disaster. In other words, social vulnerability can be defined as the differential capacity of individuals or communities to cope with social and environmental shocks (UNDP, 2024).

Again, GVCs are exposed to energy shocks given that they have access to and use only a marginal share of global energy supply.

In other words, much more energy use is needed to support economic growth and development given their energy poverty as well as significant share of the population not having access to electricity. As the world begins to transition away from fossil fuels, GVCs still have limited ability and access to reliable renewable energy sources such as solar, wind and hydropower. In fact, as energy prices increase and the traction away from fossil fuels gain traction (and as the effects and impacts of climate change intensify) GVCs that will be most vulnerable to shocks to global energy markets are those with a lack of access to renewable energy sources. Yet, securing access to critical minerals and metals that are essential for the energy transition and the global shift to low – carbon and sustainable technological industrial and economic progress has intensified competition among various countries (with the

potential risks of creating additional environmental pressures as well as geopolitical and socio – economic tensions associated with production and trade of those minerals).

Similarly, for access to renewable energy to be made more generally available, the challenge lies in building the appropriate energy infrastructure as well as integrating renewable energy into the existing electricity grid and upgrading the grid. However, the risk to investment and trade in GVCs (in the current multi-crisis) is that if energy use is not handled properly; it will have significant negative implications on agricultural productivity, agricultural export competitiveness as well as viability of industrialization based on food production and agro business. Consequently, this may jeopardize food security (which might in turn lead to political instability and conflict) while further deteriorating the investment and trade climate in vulnerable countries.

Finally, considering the domains across which GVCs are most vulnerable to shocks (as identified) and the need to build pillars and resilience; the subsequent sections of this research paper will explore some of the underlying factors of vulnerability across some of the major domains and the policy implications of reducing critical risks from the multi crisis (policy crisis) in GVCs. In other words, we shall explore how vulnerable countries can best build pillars in those domains against risks to capital flows to and across those economies (for the sake of green growth).

3.0 ENVIRONMENTAL SUSTAINABILITY FRAMEWORKS

In micro economic terminology, environment represents the basic elements of an economy that include preferences, technology and so on. Often referred to as nature, environment implies what planet earth and solar system gives us access to (for free). Physically, for several centuries, it has been known that the amount of carbon dioxide in the atmosphere affect the earth's energy balance. However, this carbon dioxide does not affect the energy in flow since solar radiation passes right through it. But the energy outflow is affected since it makes it more difficult for heat to radiate back into outer space. Consequently, if the system is initially in balance, an increase in the amount of carbon dioxide in the atmosphere will lead to a surplus in the energy balance which will make the temperature to rise. Clearly, this phenomenon is known as the Greenhouse effect while the emission of greenhouse gases leads to climate change and global warming. Unfortunately, these changes affect our economies. Even though these effects from climate change (often referred to as damages) will vary across space and take many different forms; the aggregate result has been projected to be negative for human welfare.

In fact, climate change arising has been identified as one of the greatest challenges that are encountered by governments, businesses and individuals with major implications for both human and natural systems. Therefore, understanding the full range of those impacts is critical to minimize the adverse effects of climate change. In other words, understanding Green House Gases (GHGs) and their emitting sources and sinks are of primary importance to reduce emissions and its impact causes to any level (that is, global, regional, national, organizational, household or individual).

Technically, the total set of GHGs emission caused directly and indirectly by an individual, organization, event or product is considered as carbon footprint. In other words, it describes the total amount of GHGs emissions for which an individual or organization is responsible. Clearly, most of the activities that human do at present unsustainable consumption and production patterns and practices; produce GHGs (either directly or indirectly)

In general, GHGs are gaseous constituents of the atmosphere (natural and anthropogenic) that absorb and emit radiation at specific wave lengths within the spectrum of infrared radiation emitted by the earth's surface (atmosphere and clouds). Naturally, primary greenhouse gases include water vapor (H_2o), carbon dioxide (Co_2), Nitrous Oxide (N_2O), methane (CH_2) and Ozone (O_3). However, other human – made greenhouse gases include sulphur Hexafluoride (SF_6), Hydrofluoro carbons (HFCs) and Perfluoro carbons (PFCs). However, Carbon Dioxide Equivalent (Co_2e) is a term for describing different greenhouse gases in a common unit. In other words, for any quantity and type of greenhouse gases; it signifies the amount of Carbon dioxide which would have the equivalent global warming impact. As a useful terminology, carbon dioxide equivalent allows bundles of greenhouse gases to be expressed as a single number. Similarly, Global Warming potential (GWP) is an index that describes the radiative characteristics of greenhouse gases that remain in the atmosphere as well as their relative effectiveness in absorbing outgoing infrared radiation. Essentially, the index approximates the time – integrated warming effect of a unit mass of a given greenhouse gas in today's atmosphere (relative to that of carbon dioxide). However, the Global Temperature Change Potential (GTP) is the ratio of change in global mean surface temperature at a chosen point in time from the substance of interest relative to that from carbon dioxide.

Critically, Carbon Footprint Assessment Records summarizes and reports the quantity of GHGs emissions by sources and removals by sinks (as a direct result from human activities or natural processes that have been affected by human activities). Therefore, agents (companies) can apply GWP values to GHGs emissions and removals data. So as to calculate the inventory results in units of carbon dioxide equivalent.

Numerically, carbon footprint emissions inventory comprises seven main greenhouse gases (identified in kyctoprotocol) as follows: carbon dioxide, methane, nitrous oxide, hydro fluoro carbons, perfluo carbons, sulphur, hexafluoride and nitrogen trifluoride. Clearly, each type of greenhouse gas has a different potency and atmospheric global warming potential. Thus, in order to reconcile the differences between the warming potentials of various gases as well as having a consistent measure for varying warming impact; a specific measurement unit (carbon dioxide equivalent) can be applied. Technically, it expresses the equivalency of one metric ton

of GHG to the number of metric tons of carbon dioxide needed to generate the same warming effect over a century. Notably, carbon dioxide is the most prevalent greenhouse gas (after water vapor) and consequently became the proxy by which greenhouse gas emissions are measured.

Operationally, if an organization wishes to conduct an organizational carbon footprint, certain steps should be followed as appropriate. Notably, the boundary of the assessment is a fundamental step of organizational carbon footprint. In other words, a company may own several operations but only control a small number by way of assessing only their controllable operations. Therefore, a greenhouse gas inventory for the facility will be prepared given an energy (input) sources of the factory as well as other sources of GHG emissions inclusive of fugitive and regular operation emissions). Typically, a carbon footprint for an organization is measured in tons of carbon dioxide equivalent per year.

As a GHG protocol, Project Carbon Footprint quantities and reports GHG from GHG projects. In other words, a GHG project consists of specific activity or set of activities intended to reduce GHG emissions and increase the storage of carbon or enhance GHG removals from the atmosphere. It may also include modifications to existing production, process, consumption, service, delivery or management systems as well as new systems introduction. Similarly, Product Carbon Footprints can be expressed as 'cradle to gate' footprints or 'cradle to grave' given the life – cycle stages.

Basically, it is a measure of the absolute climate impact of a product and its use. Numerically, it is calculated by summing up the climate impacts in terms of GWP for all human induced GHGs that are emitted as a consequence of a product over its life cycle and in a certain use. Here, for all stages of the life cycle ------, the direct and indirect emissions must be included in the calculation of the carbon footprint. However, indirect emissions are those caused by material and energy expenses of processes or activities. Operationally, among these activities are the supply of raw materials, energy use, transport, land use and transformation, waste treatment, waste transport, waste disposal and product usage.

Indeed, calculating a carbon footprint is the initial step towards organizational level, product level or project level carbon management. Yet, carbon neutrality is normally achieved by calculating a carbon footprint as well as reducing emissions (as far as possible) while also offsetting the remained by purchasing emissions reductions credits generated by external projects (such as renewable energy schemes or forestry projects). Therefore, carbon neutrality is used to describe the action of organizations, businesses and individuals taking action to remove carbon dioxide from the atmosphere. In fact, its overall goal is to achieve a zero carbon footprint. Here, emissions reduction (offset) are sold in tons of carbon dioxide equivalent (credits) which can come from a range of projects (such as renewable technologies, energy efficiency projects, land use change projects and methane capturing emissions from atmosphere).

Consequently, as macroeconomic framework, Green Gross Domestic Product (Green GDP or GGDP) is an index of economic growth with the environmental consequences of that growth factored into a country's conventional GDP. Essentially, GGDP monetizes the loss of biodiversity as well as accounting for costs caused by climate change. For the computation of Green GDP, the environmental and related social costs to develop the economy are taken into consideration and thus can be expressed as follows:

GREEN GDP = GDP = Environmental costs – Social cost.

Typically, the environmental costs include the following:

i. Depletion of natural resources (such as oil, coal, natural gas, wood and metals)

ii. Degradation cost of ecological environmental (such as underground water pollution, topsoil erosion and wildlife extinction)

iii. Restoration cost of natural resources (such as waste recycling, wetland restoration and afforestation)

Similarly, the social costs include the following

iv. Poverty caused by degradation of environment (such as shortage of natural resources after exploitation)

v. Extra healthcare expenditure coming with the degradation of ecological environment.

In general, since the indicators of environment are expressed in national accounts; the conversion of the resource activity into a monetary value is critical. Therefore, following United Nations System of Integrated Environmental and Economic Accounting framework, the following computational steps applies as listed below (United Nation, 2012; World Bank, 1989).

STEP A: COMPLICAITON OF THE SUPPLY AND UES ACCOUNTS (GROSS DOMESTIC PRODUCT ACCOUNTING)

STEP B: IDENTIFICATION AND COMPILATION OF ENVIRONMENTAL PROTECTION EXPENDITURES

STEP C: COMPILATION OF PRODUCED RESOURCE ACCOUNTS

STEP D: COMPILATION OF PHYSICAL RESOURCE ACCOUNTS

STEP E: VALUATION OF RESOURCE COMPILING MONETARY ACCOUNTS

STEP F: COMPILATION OF PHYSICAL ENVIRONMENTAL ACCOUNTS NON – ECONOMIC ASSETS)

STEP G: COMPILATION OF EMISSIONS BY ECONOMIC SECTOR

STEP H: MAINTENANCE COSTING OF ENVIRONMENTAL DEGRADATION

Notably, if the current values of resources are non – existent or non – explicit; the available option is to value the resource based upon the present value of expected net returns from future commercial use. Indeed, the motivation for creating a green GDP originates from the

inherent limitations of GDP as an indicator of economic performance and social progress. In other words, GDP has no capacity to identify whether the level of income generated in a country is sustainable (or not).

Therefore, the integration of environmental statistics into national accounts as well as the generation of a green GDP figure would significantly improve countries abilities to manage their economies and resources. Yet some critics of environmentally adjusted aggregates (such as GDP) believe that it may be difficult to assign values to some of the outputs that are quantified. Specifically such examples include cases where the environmental asset does not exist in a traditional market (and therefore non tradable).

However, proponents of adjusted aggregates have argued that as technological capabilities increase, more accurate methods of valuation will be developed as appropriate and adequate. In fact, more recently, United Nations have created an independent High – level Expert Group on "Beyond GDP: to develop recommendation for measures that complement or go beyond Gross Domestic Product (GDP) measurements.

Essentially, the expert group creation follows a request by United Nations member states through the PAG FOR THE FUTURE, which affirms the urgent need to move beyond traditional economic metrics that fail to capture key dimensions of human well – being and sustainable development. Unfortunately, GDP (while long used as a universal measure of prosperity) provides only a partial view of social progress (in today's complex and interconnected world).

Consequently, the high – level expert group is expected to elaborate a conceptual framework and dashboard of indicators that will help global economies to better measure sustainable development. Therefore this research study will certainly assist towards the evolution of the desirable economic measurement framework for nation's growth and sustainability.

4.0 DEBT SUSTAINABILITY FRAMEWORKS

Critically, sovereign debt has been central to discussions around the reformation of the international financial architecture. However, most low income and lower middle income countries (LMICs) are not able to mobilize external financing due to their perceived high sovereign debt risk, exorbitant cost of capital as well as increasing uncertainty in the global economy. Specifically, as the global COVID – 19 pandemic recedes into history, its impact on the debt burdens of global vulnerable countries (GVCs) remains crucial.

In fact, these countries accumulated significant debt during the pandemic years to fund massively expanded health services as well as compensate for dramatically reduced economic activity and government income. Subsequently, that accumulation continued while GVCs now have significantly higher debt levels than in the decade that preceded the pandemic. And therefore, servicing that debt has become an ever larger burden on their economies with limited resources. In other words, COVID-19 dealt a major blow to the world poorest countries by causing a recession that was estimated to have pushed several millions of people into extreme poverty (World Bank 2022). Consequently, International Monetary Organizations evolved Debt service suspension initiative (DSSI) to help countries concentrate their resources on fighting the pandemic as well as safeguarding the lives and livelihoods of millions of the lives and livelihoods of millions the most vulnerable people. Essentially, World Bank and IMF supported the DSSI implementation by monitoring spending, enhancing public debt transparency as well as ensuring prudent borrowing. Here, DSSI borrowers are committed to use freed-up resources to increase social, health or economic spending to response to the crisis. They also pledged to disclose all public sector financial commitments (involving debt and debt – like instruments). That is, they are committed to limit their non – concessional borrowing under special arrangements and finance policy. Unfortunately, the debt crisis persists as shown in table 4.1.

A	B	C	D	E
S/N	**COUNTRIES**	**DSSI PARTICIPATION**	**RISK OF EXTERNAL DEBT DISTRESS**	**RISKSOF DEBT DISTRESS**
V1	AFGHANISTAN	YES	HIGH	HIGH
V2	BANBLADESH	NO	LOW	LOW
V3	BENIN	NO	MODERATE	MODERATE
V4	BHUTAN	NO	MODERATE	MODERATE
V5	BURKINA FASO	YES	MODERATE	MODERATE
V6	BURUNDI	YES	HIGH	HIGH
V7	CAPE VERDE	YES	MODERATE	HIGH
V8	CAMBODIA	NO	LOW	LOW
V9	CAMEROON	YES	HIGH	HIGH
V10	CENTRAL AFRICAN REPUBLIC	YES	HIGH	HIGH
V11	CHAD	YES	HIGH	HIGH
V12	COMOROS	YES	HIGH	HIGH
V13	CONGO DEM REP	YES	MODERATE	MODERATE
V14	CONGO REP	YES	IN DEBT DISTRESS	IN DEBT DISTRESS
V15	COTE D'IVOIRE	YES	MODERATE	MODERATE
V16	DJIBOUTI	YES	IN-DEBT DISTRESS	IN-DEBT DISTRESS
V17	ERITREA	-	-	-
V18	ETHIOPIA	YES	IN-DEBT DISTRESS	IN-DEBT DISTRESS
V19	GAMBIA	YES	HIGH	HIGH
V20	GHANA	NO	HIGH	HIGH
V21	GUINEA	YES	MODERATE	MODERATE
V22	GUINEA – BISSAU	YES	HIGH	HIGH
V23	HAITI	NO	HIGH	HIGH
V24	HONDURAS	NO	LOW	MODERATE

V25	KENYA	YES	HIGH	HIGH
V26	KIRIBATI	NO	HIGH	HIGH
V27	KYRGYZ REPUBLIC	YES	MODERATE	MODERATE
V28	LAO P.D.R	NO	IN-DEBT DISTRESS	IN-DEBT DISTRESS
V29	LESOTHO	YES	MODERATE	MODERATE
V30	LIBERIA	YES	MODERATE	MODERATE
V31	MADA GASCAR	YES	MODERATE	MODERATE
V32	MALAWI	YES	IN- DISTRESS	IN- DISTRESS
V33	MALI	YES	MODERATE	MODERATE
V34	MAURITANIA	YES	MODERATE	MODERATE
V35	MICRONESIA FED SIS	NO	MODERATE	MODERATE
V36	MOZAMBIQUE	YES	HIGH	HIGH
V37	MYANMAR (BURMA)	YES	LOW	LOW
V38	NEPAL	YES	LOW	LOW
V39	NICRA GUA	NO	MODERATE	MODERATE
V40	NIGER	YES	MODERATE	MODERATE
V41	NIGERIA	NO	-	-
V42	PAKISTAN	YES	-	-
V43	PAPUA NEW GUINEA	YES	HIGH	HIGH
V44	RWANDA	NO	MODERATE	MODERATE
V45	SAMOA	YES	MODERATE	MODERATE
V46	SAO TOME AND PRINCIPLE	YES	IN-DISTRESS	IN-DISTRESS
V47	SENEGAL	YES	MODERATE	MODERATE
V48	SIERRA LEONE	YES	HIGH	HIGH
V49	SOLOMON ISLANDS	NO	MODERATE	MODERATE
V50	SOMALIA	NO	MODERATE	MODERATE
V51	SOUTH SUDAN, REPUBLIC OF	NO	HIGH	HIGH

V52	SRI LANKA	-	-	-
V53	SUDAN	-	-	-
V54	SYRIAN	-	-	-
V55	TAJIKISTAN	YES	HIGH	HIGH
V56	TANZANIA	YES	MODERATE	MODERATE
V57	TIMOR LESTE	NO	MODERATE	MODERATE
V58	TOGO	YES	MODERATE	MODERATE
V59	UGANDA	YES	MODERATE	MODERATE
V60	UZBEKISTAN	NO	LOW	LOW
V61	VANUATU	NO	HIGH	HIGH
V62	YEMEN	YES	-	-
V63	ZAMBIA	YES	IN-DISTRESS	IN-DISTRESS
V64	ZIMBABWE	-	-	-

Regrettably, tight monetary policy in high income countries (advanced economies) has pushed interest rates to their highest level in the last two decades while central banks have kept rates elevated in an effort to ease inflationary pressures. In other words, higher global interest rates have augmented interest expenses on existing debt obligations contracted at variable rates and therefore made newly contracted borrowing more expensive for LMICs (inclusive of vulnerable countries). Unfortunately, these expenses have diverted resources away from other critical areas (including social services and infrastructure development) which have negatively affected economic growth. Clearly, table 4.2 shows the time trend of external debt stock of developing economies (World Bank, 2024D). Here, from a maturity stand point, the increase in total debt stock of developing countries was driven by an increase in both short – term and long – term debt in the year (2023). Specifically, short – term debt stock increased by approximately three percent while long – term debt stock increased by two percent.

Notably, developing countries increased reliance on short – term debt resulted from those countries needs to cover liquidity requirements (such as times of economic uncertainty when

short – term was used as a flexible financing options) as well as during periods of external debt – shocks (when countries increased short – term debt as a response to urgent funding requirements) and to the lack of long – term external funding. Basically, the use of short – term debt was also a debt management policy response to prevailing high interest rates (as countries opted for lower – cost debt with shorter maturities to avoid the higher interest costs of long – term commitments).

Technically, the total external debt of a country is the sum of public and publicly guaranteed debt, private non-guaranteed debt as well as short – term debt. Then, public and publicly guaranteed external debt comprises long – term external obligation (maturities of over one year) of all public debtors inclusive of debt held

TABLE 4.2 LIMCS EXTERNAL DEBT STOCK REVIEW (US $ BILLIONS)

S/N	CATEGORIES	2010	2019	2020	2021	2022	2023
I	TOTAL EXTERNAL DEBT STOCKS	3,865	7,754	8,173	8,819	8631	8837
II	LONG – TERM EXTERNAL DEBT STOCKS	2646	5543	5896	6091	5984	6113
III	SHORT – TERM EXTERNAL DEBT STOCKS	1094	2048	2062	2341	2264	2341
IV	DISBURSEMENTS (LONG- TERM)	577	1134	1140	1156	937	1073

V	PRINCIPAL PAYMENTS (LONG – TERM)	315	813	793	845	922	921
VI	INTEREST PAYMENTS (LONG-TERM)	85	211	183	203	199	255

by the central government as well as those by state – owned enterprises. In contrast, private non-guaranteed debt comprises long – term external obligations of private debtors that are not guaranteed by a public entity. However, short – term debt can be defined as debt with an original maturity of one year or less. As multilateral creditor, World Bank has increasingly stepped up its role of lender of last resort, thereby compensating for declines in financing from the private sector. Specifically, through its concessional lending window, World Bank has been supporting some vulnerable countries under International Development Association (IDA). Essentially, these countries facing higher risk of debt distress are provided with ex-post as well as implicit ex ante debt relief and financial support. Notably, most IDA credits carry a zero or very low interest rate while repayments typically extend over several decades of years. However, some IDA – eligible countries receive all or part of their IDA resources in the form of grants that carry non repayments in the future.

Although IDA focuses on the most impoverished nations; International Bank for Reconstruction and Development (IBRD) has played a crucial role (as World Bank's Lending Arm) in coordinating responses to regional and global challenges. Basically, they provide loans and financial services to developing and credit worthy low –income countries. Indeed, IBRD was created to support countries for post – World War II reconstruction and has continued its crisis and emergency support via increased lending to countries affected by other crisis (such as 2008 / 2009 financial crisis, 2014 Ebola outbreak and COVID-19 pandemic).

Operationally, the dual (IBRD/IDA) lending has responded positively to adverse external shocks affecting the economies of countries eligible for such financing. Clearly, this counter cyclical lending has been a recurring and stabilizing response to dramatic drops in economic growth in those economies over the years.

Furthermore, the surge in global debt accumulation has contributed to liquidity and sustainability issues in vulnerable countries and hereby resulting in elevated requests for debt repayment suspension agreements. Specifically, some progress was made toward sovereign debt resolutions in the context of the group of twenty common framework, Paris club and bondholders (World Bank, 2024D). However, the tightening of monetary policy in the United States (in 2022) affected exchange rate movements which drove an increase in the value of US Dollar ($) relative to other currencies. In fact, this policy action persisted and made repayment of non – local currency debt more costly for several vulnerable countries (as their local currencies depreciate).

Consequently, the increase in total debt service payments for the GVCs is a direct outcome of the rapid accumulation of external debt over the past decade. Notably, apart from a slight reduction in 2020 (due to the suspension of debt service payments from debt service suspension initiative agreements) debt service burdens were on an increasing trajectory until 2023 as partially seen in table 4.2

Although borrowing (vulnerable) countries can monitor and measure the principal repayment amounts of a debt instrument according to pre – established repayment schedules set in debt contract agreements (since inception of the liability); interest payment amounts for debt contracted at variable interest rates are clearly dependent and greatly affected by fluctuations in global interest rates. Thus, the low – interest rate regime that prevailed (until 2021) kept interest costs relatively low. But as interest rates were aggressively increased (in 2022) and further (in 2023) to tame inflation; interest payments of variable rate contracted debt also increased. Similarly, high interest rates have affected new borrowing agreements for GVCs (which are now being contracted at much higher rates).

AFRICAN FINANCIAL STABILITY MECHANISM

Indeed, an observed trend within Africa's rising debt landscape is the shift towards more non – concessional borrowing. Unlike concessional loans which have conventionally constituted significant portion of Africa's debt; there has been increase reliance on non – concessional financing in recent times.

In fact, before 2006, only seven African countries had issued Eurobonds. But as of 2024, about twenty three African countries have tapped into international markets to meet their foreign currency balance of payment requirements and clearly issued more than one hundred and seventy – five Eurobonds with above 200 billion dollars in total face amount (ADB, 2025).

In other words, for the past two decades, Africa's public debt has increased significantly and is now more non – concessional and short – term. Therefore, repayment obligations are now falling more quickly than before. Unfortunately, these escalate debt refinancing needs. Notably, Africa's liquidity needs for short – term debt retirement or refinancing are estimated at ten billion dollars per annum over the next decade. Although debt refinancing needs are high, access to liquidity for African countries comes at high cost and much limited. In other words, African countries face challenges in accessing markets as well as paying a higher liquidity – access premium compared to peers due to several domestic and external factors. And notwithstanding the high cost of accessing liquidity; international financial architecture has been ill – equipped to provide sufficient and timely relief to African's debt refinancing challenges. Even though, Eurobond markets offer the only primary avenue for large – scale debt refinancing in African countries, it has its short – comings (especially regarding its high cost of capital and short – term durations).

Thus, as the only continent without a regional financial arrangement; both African Union Commission (AUC) and African development bank (ADB) has been on the forefront in the efforts to establish the African financing stability mechanism (AFSM) with the primary purpose of providing African countries with liquidity support for debt refinancing. Consequently, the Assembly of Heads of State and Government of African Union by decision

(in 2022) called for the establishment of an AFSM and directed the AUC/ADB to work with all relevant stakeholders to accelerate operationalization of the mechanism and its growth. Similarly, African Union Ministers of Finance (in 2022) called for the establishment of the AFSM to help prevent illiquidity – driven defaults by offering financing at advantageous terms to illiquid countries at risk of debt distress.

Basically, the AFSM aims to keep African countries cope with risks of debt distress and financial crisis by providing debt – refinancing support at illiquid countries at risk of debt distress on advantageous financial terms (contingent upon specific policy actions. Fundamentally the key objectives of AFSM include the following:

A. Ensuring continuous access to financial markets even during periods of volatility or when market access is restricted.

B. Providing access to cheaper funding through a higher – rated vehicle as well as reducing the cost of borrowing for member countries

C. Taping into the largest pool of public markets as well as moving away from reliance on limited bilateral funding sources.

D. Participating in the primary and secondary markets will help to reduce the perceived risk associated with African debt and thereby lowering the premium charged on African borrowing.

E. Recognizing (with support) that regional members can face external shocks

Thus, in order to achieve its core mandate of debt refinancing; the AFSM's lending toolkit should be aligned and able to assist sovereign nations facing on immediate need for budgetary support. Technically, the proposed lending toolkit shall include refinancing loans; primary and secondary market purchases; guarantees or partial guarantees; and special situations crisis support. However, in consistent with the AUC Specialized Technical Committee (STC) on finance, monetary affairs, economic planning and integration (in 2024); AFSM was recommended to adopt a dual capital structure (by combing market financing with

membership contributions). Essentially this approach will allow the AFSM to mobilize resources from international capital markets while ensuring stable funding base through member's contributions.

Operationally, AFSM could be established as a treaty – based organization or a non – treaty special purpose vehicle. In other words, these are several options for a treaty – based organization such as an organ, institution or office of the AUC or specialized agency of AUC or treaty organization not affiliated with the AUC.

However, Africa has insufficient mechanisms for debt refinancing but instead on costly market – based options. Yet, the International Monetary Fund (IMF) and multinational Development Banks (MDB) primarily focus on new financing and technical assistance rather than debt refinancing. Therefore, establishing a dedicated regional financial arrangement could stabilize Africa's financial by addressing the debt refinancing gap. In other words, the need for such a mechanism is underscored by the limitations of current institutions that are often constrained in their ability to provide comprehensive debt relief and support.

REGIONAL FINANCIAL STABILITY ARRANGEMENTS

Structurally, the inclusion of the IMF's non – toleration policy for multilateral arrears include institutional membership with at least two sovereign members excluding non – sovereign members. Thus, by looking at precedents in the RSA space, all existing RFAs are treaty based (as shown in table 4.3).

TABLE 4.3: REGIONAL FINANCIAL STABILITY ARRANGEMENT REVIEWS

S/N	INSTITUTIONS	CREDIT	LEGAL STATUS	AFFILIATIONS
A	ARAB MONETARY FUND	NO RATING	TREATY	ARAB LEGQUE SUB ORGANISATION
B	BRICS CONTINGENT RESERVE ARRANGEMENT	NO RATING	TREATY	LINKED WITH BRICS AND NO FORMAL AFFILIATION
C	CHIANG-MAT INITIATIVE	NO RATING	TREATY	NO FORMAL AFFILIATIONS
D	EURSIAN FUND FOR STABILIZATION AND DEVELOPMENT	NO RATING	TREATY	NO FORMAL AFFILIATIONS
E	EUROPEAN FINANCIAL STABILIZATION MECHANISM	Aaa/AAA/AAA	EU: PART	PART OF EU
F	EUROPEAN STABILTY	Aaa/-/AAA	TREATY	COOPERATES WITH EU BUT NOT AN AGENCY
G	LATIN AMERICAN RESERVE FUND	Aa2/AA/AA	TREATY	NO FORMAL AFFILIATIONS

H	NORTH AMERICAN FINANCIAL AGREEMENT	NO RATING	TREATY	NO FORMAL AFFILIATIONS

Notability, the Arab monetary fund is part of the Arab league (which was established by treaty). Again, the European financial stabilization mechanism is part of the European Union (equally established by treaty). However, the main setback of the establishment of AFSM as a treaty – based organization is the potential length of time that international agreements usually take to come in force. Thus, to mitigate the above risk; the establishment of an operational stability mechanism would need strong sponsoring from core group of founding members. Alternatively, the proposed financial stability mechanism could be established as a special purpose financing facility. Here, the entity could be incorporated as a company and capitalized (with potential shareholders) establishing its mandate and authorized scope of operations. However, as all other existing RFSAs were established by treaty; the proposed African mechanism may stand out if established under a different legal, governance and capital model. Furthermore, access to preferred creditor status would be unlikely with implications for funding costs and risk appetite. Thus, establishing AFSM as special purpose financing vehicle does not exclude other structuring decisions such as affiliation with the African Union (membership structure and resource mobilization strategy).

Operationally, enhancing transparency in debt data and agreements as well as government borrowing terms is critical to an effective debt management strategy. In fact, the issues of hidden debt (unreported or misreported /government liabilities) also undermines accurate debt analysis and public trust. Therefore, there is critical need to strengthen institutions (inclusive of legal framework) statistical capacity and public accountability in those vulnerable (borrowing) countries as well as increasing the transparency of lending practices by creditors. Consequently, sovereign debt registry must be created. In other words, more credible ratings can ease the pressure on debt burdened countries by potentially reducing the costs of borrowing.

Again, for the sake of incentivizing long term low – cost financing; domestic revenue mobilization can provide much needed financing to vulnerable countries. Yet, tackling illicit – financial flows; taxing high net worth individuals and multinational corporations as well as using progressive tax instruments (like personal income tax) have potential to raise domestic revenues in GVCs. Specifically advancing the United Nations agenda on international tax cooperation and providing technical support to tax authorities are various ways to help vulnerable countries secure their fair share of tax revenues. However, external financing is still needed to supplement domestic resource mobilization and consequently a major boost in lending is extremely critical. Therefore, multilateral development banks and international development finance institutions have a central role to play in providing a gradual increase in affordable financing. Here, efforts are equally needed to curb the procyclicality of private capital flows to and from those vulnerable countries.

Specifically, to tackle the short – term debt overhang faced by many vulnerable countries; there should be global calls on official creditors to undertake similar initiatives to those that have worked in the past such as provision of debt relief; deep reduction or suspension of interest payments; cuts to charges and surcharges on credit as well as increases in grant allocations and available special drawing rights. Again, to address long – term financing needs; **lending decision should be based on long – term models of debt sustainability instead of simple rules of thumb** (like arbitrary debt / GDP ratios).

In other words, rather than undermining debt sustainability; investment – driven borrowing should be linked to low sovereign debt risks as well as being incentivized as a way to finance sustainable development while kick starting the economic growth of the global vulnerable countries (GVCs).

Perhaps, in the long term, it will be crucial to create a permanent institutional mechanism to restructure sovereign debts. Technically, as United Nations Agency, the proposed body should serve as a framework to renegotiate debts in three stages; voluntary renegotiation, medication and arbitration (with possible fixed deadlines as appropriate and statutory).

5.0 CLIMATE FINANCE FRAMEWORKS

Indisputably, all parts of the global economy are at risk of being affected by extreme weather events and trend changes. In other words, the world is currently facing a poly crisis of complex and inter-twined global economic, social and environmental challenges. Yes, it is extremely critical that nations tackle these crises by transitioning to a more environmentally and socially sustainable economy. Unfortunately, the markets are failing to deliver the necessary changes at the pace required and there is no realistic prospect that (without much deeper structural change) market forces in isolation will bend the curve as well as protecting the social and environmental foundations on which society (and businesses) depend. Therefore, in order to deliver a transition to a sustainable economy, we need to change markets. Essentially, that charge requires a concerted systemic effort across financial actors, policy makers, civil society and consumers (Seega, et al., 2025).

However, while these are enough money in the system to address the scale of nature loss and climate crisis; it is not flowing towards the solution with the speed and quantum required. Similarly, a scalable financeable pipeline of projects is not on standby to receive the funds. Yet, the Paris agreement confirmed that developed countries needed to lead in providing financial assistance to emerging and developing economies for mitigation and adaptation to climate change. Notably, the last decade have seen the establishment of a number of initiatives; bringing industry leaders together to drive change in the financial sector. Specifically, these include united Nations Environment Programme Initiative Collaborations, climate action, Glasgow financial alliance for Net Zero, etc.

Furthermore, green industrial strategies are rapidly becoming powerful levers to move the financial markets. In other words, recognizing the growth potential of the green economy as well as the need to remain competitive in the global market; several nations have been channeling public policies and innovative instruments to de-risk sustainable investments (while shifting capital towards low carbon technologies). And more recently, the conversation on reforming the international financial architecture has been intensified with the aim of unlocking capital flows to developing and vulnerable countries.

Unfortunately, the above ostensible progress have not unlocked a fundamental new paradigm where sustainability is embedded into financial value; and thereby enabling the financial system to direct all its latent power towards unlocking action on climate, nature and inequality.

Again, the effects of climate change have imposed costs on failure generations that are beyond the typical horizons considered in the business cycle, political cycle as well as monetary and fiscal policy. In other words, current economic models incentivize financial institutions to generate profits for themselves while imposing the cost of negative externalities (such as climate change, land degradation and pollution on larger society). Indeed, while there has been a lot said about transforming financial sector; these have often overlooked the fact of only financing what is present in the current real economy (rather than empowerment to bring++ about new one). Thus, the current financial system is not incentivized to consider sustainability in financial decision – making. Clearly, these are no capital charges on unsustainable activities since the current capital framework is not intended to protect the broader economy from wider climate and nature risks. Consequently, there is no incentive to exit stranded assets if they are rent bearing in the short-term. And because there are market failures to price the true cost of economic activity; climate – negative and nature – degrading activities make more money than sustainable activities (by directing private capital towards anticipated profits).

Yet, despite the above challenges a market transition is taking place in certain sector. In fact, feasible adaptation and mitigation options are now available and there is enough capital in the system to transition. In other words, some investment funds are starting to move on adaptation while realizing that physical risks of climate change are already existing (Mundy, 2025).this implies that finance needs to change to avoid a substantial risk of a disruptive market reprising (once the sentiment shifts to reflect physical reality) as well as benefiting from the multitude of opportunities that accompany such transition. Therefore, the three essential shifts that are required to benefit from these opportunities include the following:

A. Shifting industrial and financial policy that is, policy advocacy and thought leadership for industrial and financial regulatory innovation.

B. Shifting narratives and mindsets, that is sustainable finance leadership capacity building as well as shifting narratives to unlock a sentiment change.

C. Shifting core financial structures that is, developing holistic financial models (structures); demonstrating what is possible (by showing how to scale) as well as unlocking truly transformative financial architecture for a sustainable economy.

Surely, given the observed changing and challenging geopolitical context; the systemic transformation of industry is inevitable. In other words, we need to respond to the current moment without dismay and loss of momentum but with new thinking, coalitions, alliances, narratives and solutions for well – managed transition (which takes into account of scientific underpinning and reality of sustainability challenges). Structurally, across the financial system; a range of different types of stakeholders need to collaborate engage and partner along. These include asset owners, investors (institutional and private) banks, insurers, private, equity and private debt companies, venture capitalists as well as corporate in the industries that are key for the transformation. In fact, we need new strategies to move the financial system and new spaces to convene its actors to co – develop while executing the vision of finance as the core of a sustainable economy. Clearly, our focus on this journey will be to collaborate; co – create research and tools; build narratives as well as human skills and capacity required to rewire global financial system to support sustainable economy (especially for the vulnerable countries).

Specifically, the SECD (2024)

Climate Adaptation Investment

Framework provides a comprehensive approach for strengthening the domestic policy framework for investment in climate adaptation. Therefore, building on the above policy framework, we can identify some policy areas for enabling investment in adaption. Here, each building block contains diagnostic questions to identify potential policy gaps as shown below. Basically, they include the following components:

I. **Strategic planning and policy coherence -** Articulating strategic priorities as well as implementing institutional coordination mechanisms to guide investment in adaptation

II. **Regulatory Alignment –** Addressing regulatory distortions and market failures that hinder investment in climate adaptation.

III. **Insurance and Risk transfer -** Ensuring that the policy framework for insurance and risk transfer supports efforts to understand and reduce climate – related risks.

IV. **Public Finance and Investment –** Ensuring that the benefits of investing in adaptation are reflected within public spending.

V. **Sustainable finance –** Improving understanding of climate risks and benefits of adaptation through taxonomies, disclosure arrangements as well as green financial instruments

VI. **Supporting and providing incentives for private investment –** Design and implement well – targeted public support to encourage investment in adaptation by the private sector.

Furthermore, for the sake of scaling up domestic resource mobilization, green budgeting and expenditure tracking provides a framework that can support the integration of adaptation into budgetary processes. Notably, key instruments include the integration of climate into the design of medium – term expenditure framework; requirements specified in the budget preparation phase and reporting. Essentially, the above effects can be supported by the development of measurement frameworks to define and track public investment that supports climate adaptation. In other words, by setting targets and tracking expenditure relevant to adaptation investment can increase accountability and transparency (which can strengthen incentives to mainstream adaptation). Again, project and programme appraisal tools may need to be adjusted to account for the role of uncertainty, non – market benefits and discount rates.

Yet, despite the strong economic case for domestic investment in adaptation; many vulnerable countries struggle to dedicate the required resources to finance their needs unfortunately, these challenges have been exacerbated in recent years by rising levels of public debt and higher interest rates. Therefore, external finance from public and private sources is highly critical.

In other words, international assistance needs to be anchored in country – defined and country – led national plans. However, recipients need to be given the confidence that their adaptation plans (including wider development and climate priorities) will be bucked and financed (partially) by stable long term assistance. Clearly, this underscores the need to move towards programmatic approaches for financing and supporting adaptation (via country platforms). In other words, systematic efforts to co-ordinate beneficiary government's domestic efforts, donor assistance and private investment can simultaneously guide domestic policy and reform efforts to reflect investor needs as well as providing greater direction for international public and private climate finance on priorities.

Notably, the African Development Bank (AFDB) is prioritizing investments for adaptation through the climate adaptation country compacts which seeks to increase adaptation investments in Africa. Technically these compacts are multi – sectorial in nature with specific programs to mainstream and adaptation in key priority sectors identified by the countries and other key sectors that will be significantly affected by climate change in the short term and medium term at country level. Further to facilitating co – ordination between individual African countries and their development partners as well as private investors to increase adaptation investments; the compacts outline key investment priorities, financing needs as well as finance mobilization strategies for implementing climate adaptation measures for each country (while navigating available financing opportunities). Essentially, the compacts (when fully deployed) will provide individual African countries with a solid foundation for decision making, resource allocation and greater investments in their adaptation projects and programs.

Again, the Africa Adaptation Acceleration Program (AAAP) is a flagship initiative of the AFDB and Global Center on Adaptation (GCA). Basically, it aims to mobilize billions of

dollars to scale up and accelerate climate change adaptation actions across Africa. Similarly, G7 Adaptation Accelerator Hub (AAH) seek to address constraints to private investment in innovative adaptation solutions by supporting co-ordination, pipeline development and better alignment between funding and needs. Specifically, the initiative seeks to address persistent data and capacity gaps that hinder the development of bankable adaptation projects. Essentially, the HUB supports developing countries (particularly in Africa) by improving access to decision – relevant climate information; facilitating investment planning processes as well as fostering institutional capacity – building. In other words, through the provision of technical assistance, support to data infrastructure as well as socially informed feasibility assessments; AAH has helped to translate national priorities into actionable pipelines (such as in vulnerable countries facing barriers to accessing international climate finance).

Indeed, for the sake of enabling innovative finance mechanisms, the use of blended finance and other private sector instruments has recently grown. Yet, they remain underutilized for adaptation purposes. Operationally, these span a wide breadth of financing instruments and structures inclusive of debt, bonds equity, guarantees, structured funds, grants and technical assistance. Similarly, African Green Bank Initiative (AGBI) is expanding the availability of green finance in Africa while assisting multiple African countries to establish National Green Banks. Again, African financial Alliance on Climate Change (AFAC) advances AFDB's climate change and Green Growth (CCGC) strategic framework by equipping African financial institutions with tools and skills to mobilize domestic private climate finance as well as helping to address Africa's climate financing gap.

Finally, in addition to deploying development assistance (catalytically) to support the mobilization of private finance; development providers can also support country – led efforts to scaling up other innovative financial approaches to address the significant climate adaptation investment needs in vulnerable countries. Basically, these include debt for climate swaps, resilience bonds, natural disaster risk (climate resilient debt clauses).

6.0 GREEN AND DEBT SWAP OPTIONS

1in recent times, climate change has been clearly developing into a systematic crisis. In fact, IPCC (2023) noted that if global warming continues to increase at the current rates it is likely to reach a 1.5^0C increase in overall global temperature as soon as 2030 (and beyond).

Specifically, the over stepping of the 1.50c threshold is likely to trigger numerous systematic consequences for nature and biodiversity as well as for human societies. In fact, the impacts will extend beyond elevated temperatures and will exacerbate inequality across and within countries (and societies). Clearly, this will be evident in a decline in agricultural productivity, diminishing viability of traditional grazing areas; job losses, supply chain disruptions, increased financial risks as well as trade setbacks. Unfortunately, developing countries and vulnerable communities bear the greatest burden by significantly impeding both national and international pursuits of sustainable development. Yet, most developed countries exposed to climate – related challenges are generally least well positioned to respond; requiring the mobilization of large amounts of funding (inclusive of private sector funds).

Therefore, the global response needs to be all – inclusive while Debt for climate swaps (DFCS) provides an innovative financing stream towards those countries that are more vulnerable to debt and fiscal challenges as well as climate change effects.

Indeed, DFCS can provide innovative tools for governments and environmental organizations to mobilize funding into climate related commitments while braking the vicious cycle between increased debt and climate vulnerabilities. Essentially, such operations can attract additional private funding as well as generating fiscal space for climate – related spending (beyond the direct savings of the swaps).

However, for DFCS to become an effective tool in addressing debt sustainability challenges as well as generating sufficient savings for necessary climate related investments globally; they would need significant scaling up. Consequently, over the past years, new debt swap structures have emerged; enabling the implementation of DFCS on a larger scale as well as offering an interesting policy tool for governments and environmental organizations.

Operationally, a tailor – made model has been built to analyze suitable countries for DFCS (Deep, et al., 2025). Basically, the model employs a quantitative approach (involving numerical data) which focuses on three key pillars: Environmental Debt and Macroeconomics as well as institutions.

Environment Pillar assesses countries vulnerability and exposure to climate change (such as risks associated with extreme weather events and potential income loss measured as a percentage of their GDP). Again, it evaluates countries absorption capacity to GHG mitigations activities and considers the repercussions of biodiversity loss (intricately entwined with overarching climate crisis). Specifically, the pillar identifies countries where environmental challenges may significantly affect their socio economic conditions as well as their debt sustainability. However, the pillar is structured around five criteria: countries overall susceptibility to climate related disruptions; countries climate risk exposure to extreme weather events; potential national income loss from climate risks as percent of GDP; climate change mitigation capacity as well as pressure on biodiversity. In contrast, Debt and Macroeconomics pillar focuses on countries' debt situation and economic indicators as well as supporting the identification of countries struggling to fund essential environmental initiatives due to financial constraints. Basically, countries best positioned to benefit from DFCS are those facing limited budgetary room for crucial climate related investments due to short term financial constraints. Again the presence of outstanding tradable debt that trades at a discount indicates potential for DFCs transactions. In other words, the opportunity to buy debt at significantly discounts in secondary markets enhances the financial effectiveness of DFCS initiatives which generates larger proceeds. Similarly, INSTITUTIONAL PILLAR analyses government effectiveness and regulatory frameworks. Critically, it evaluates countries ability to efficiently manage and allocate financial flows. Here, two factors are prerequisites for the implementation of DFCS commitments; they are strong government capacity and sourced regulatory framework. Thus, DFCs are complex financial structures that require stable geopolitical situation to be implemented given the long negotiation preceding the execution of the transaction. Therefore, using the above pillars, table (6.1) shows the various countries eligible for DFCS implementation (Deep, et al., 2025).

TABLE 6.1: DFCS SUITABILITY: VULNERABLE COUNTRIES IDENTIFICATION

A	B	C	D	E	F
S/N	**COUNTRIES**	**GLOBAL SCORE**	**ENVIRONMENTAL SCORE**	**DEBT SCORE**	**INSTITUTIONAL SCORE**
V1	AFGHANISTAN	-	-	-	-
V2	BANBLADESH	-	-	-	-
V3	BENIN	00.44	00.56	00.34	00.47
V4	BHUTAN	-	-	-	-
V5	BURKINA FASO	00.39	00.47	00.34	00.38
V6	BURUNDI	-	-	-	-
V7	CAPE VERDE	-	-	-	-
V8	CAMBODIA	-	-	-	-
V9	CAMEROON	-	-	-	-
V10	CENTRAL AFRICAN REPUBLIC	-	-	-	-
V11	CHAD	-	-	-	-
V12	COMOROS	-	-	-	-
V13	CONGO DEM REPUBLIC	-	-	-	-
V14	CONGO, REP	00.39	00.40	00.46	00.24
V15	COTE D'IVOIRE	00.43	00.54	00.34	00.47
V16	DJIBOUTI	-	-	-	-
V17	ERITREA	-	-	-	-
V18	ETHIOPIA	00.45	00.57	00.40	00.34
V19	GAMBIA	-	-	-	-
V20	GHANA	-	-	-	-
V21	GUINEA	-	-	-	-
V22	GUINEA – BISSAU	00.43	00.62	00.38	00.22
V23	HAITI	-	-	-	-

V24	HONDURAS	00.40	00.51	00.32	00.37
V25	KENYA	0.50	00.61	00.44	00.45
V26	BIRIBATI	-	-	-	-
V27	KYRGYZ REPUBLIC	-	-	-	-
V28	LAO PDR	00.54	00.66	00.52	00.35
V29	LESOTHO	-	-	-	-
V30	LIBERIA	-	-	-	-
V31	MADA GAS CAR	00.40	00.66	00.24	00.33
V32	MALAWI	00.45	00.53	00.43	00.35
V33	MALI	-	-	-	-
V34	MAURITANIA	-	-	-	-
V35	MICRONESIA FEDSB	-	-	-	-
V36	MOZAMBIQUE	00.46	00.57	00.42	00.37
V37	MYANMAR	-	-	-	-
V38	NEPAL	-	-	-	-
V39	NICRAGUA	-	-	-	-
V40	NIGER	00.44	00.63	00.32	00.37
V41	NIGERIA	00.43	00.62	00.35	00.28
V42	PAKISTAN	-	-	-	-
V43	PAPUANEW GUINEA	00.45	00.50	00.45	00.36
V44	RWANDA	00.51	00.64	00.34	00.57
V45	SAMOA	-	-	-	-
V46	SAOTOME AND PRINCIPLE	-	-	-	-
V47	SENEGAL	00.43	00.46	00.39	00.49
V48	SIERRA LEONE	-	-	-	-
V49	SOLOMON ISLANDS	-	-	-	-
V50	SOMALIA	-	-	-	-

V51	SOUTH SUDAN	-	-	-	-
V52	SRI LANKA	00.50	00.65	00.42	00.41
V53	SUDAN	-	-	-	-
V54	SYRIAN ARAB REPUBLIC	-	-	-	-
V55	TAJIKISTAN	-	-	-	-
V56	TANZANIA	00.39	00.56	00.26	00.41
V57	TIMOR LESTE	-	-	-	-
V58	TOGO	00.39	00.46	00.33	00.39
V59	UGANDA	00.44	00.66	00.29	00.41
V60	UZBEKISTAN	-	-	-	-
V61	VANUATU	-	-	-	-
V62	YEMEN	-	-	-	-
V63	ZAMBIA	00.50	00.45	00.58	00.39
V64	ZIMBABWE	-	-	-	-

Notably, higher scores in each pillar indicate greater suitability for debt for climate swap (DCFS). However, high scores in the environment and debt pillars show significant vulnerability whereas a high score in the institutional pillar signifies a strong framework. Yet, despite the high volume of transactions (since their creation in the 1980's) DCFS remained relatively low in terms of volume of debt treated, and being predominantly bilateral transactions; they relied on the goodwill of the participating official bilateral creditor. In recent times, DFCS regained momentum as demonstrated by the execution of several multipartite transactions by allowing generating larger amounts of savings that can be directed towards climate related commitments. However, each type of structure brings its own advantages and disadvantages which make the optimal structure design strongly dependent on the country's specific characteristics. Therefore, DFCS can be broadly divided into bilateral and multipartite structures.

IN OFFICIAL BILATERAL OR NON –COMMERCIAL DFCS STRUCTURE, transactions are better suited when there is an urgency to implement the swap. Here, project

absorption capacity is limited and financial incentives for the creditors are less prevalent. In other words, there are direct arrangements between a debtor country and one or more official creditors that involve the cancellation of debt with the agreement that the resulting debt service savings will be directed towards an agreed use to fund climate – related actions or investments.

Operationally, in bilateral DFCS, a creditor reduces the debt service owed by a debtor government while the debtor designates an agreed amount for a specified purpose (such as funding a nature conservation project).

In fact, the model is conventionally employed in official government –to-government debt swaps that represents a form of bilateral financial assistance.

IN TRILATERAL OR COMMERCIAL OR MULTIPARTITE DFCS STRUCTURES, transaction can generate larger savings by supporting DFCS at scale which are well suited to finance larger or multiple projects. Here, targeted creditors would consist of investors holding commercial debt that is trading at a significant discount. In other words, these arrangements involve buyback or exchange of debt held by private creditors (often financed by donors through non – governmental organizations or NGO). Essentially, the NGO provides or facilitates a loan to the debtor country at below – market interest rates given the following operational requirements:

A. The debtor country must use the proceeds to repurchase debt held by commercial creditors

B. The debt relief generated (which is the difference between the avoided debt service requirements on the retired debt and the new (lower cost) must be allocated to finance climate related projects.

Basically, the above transactions can include the use of a trust fund to administer the savings and credit enhancements to reduce the cost of the new borrowing.

Again, it is possible to involve innovative mechanisms for the new debt (such as repayment with carbon credits) to increase debt service savings. Indeed, DFCS are most effective when the primary barrier to climate investment is limited fiscal space. Consequently, traditional climate finance instruments (such as green loans or bonds) are insufficient since they could further increase debt burdens. Therefore, addressing the above constraint requires fiscal support which can take the form of climate – conditional grants or comprehensive debt restructuring that integrates climate conditions. However, in situations where a vulnerable country is an already experiencing debt distress DFCS could be less effective since they require debt service savings to be committed only to the climate projects. Yet, DFCS remain a valuable tool when they expand the fiscal capacity of a debtor (vulnerable) country that cannot afford climate investments through additional borrowing alone as well as being structured to maximize benefits for the debtor.

More recently, special purpose vehicles (SPV) have been set up as part of the DFCS multipartite structure. Basically, SPV finances itself through funding from financial institutions and donors; through grants, loans or bonds (private placement or public offer) with each bringing different advantages. Essentially, the structure may benefit from a higher credit rating compared to the sovereign; which lowers the risk profile of the facility issued by the SPV to the government so as to conduct the buyback. However, establishing an SPV makes the transaction more complex (which can slow down its execution as well as increased cast). Yet, DCFS can be perceived as comparable to grants for debtor governments which optimizes cash flows by matching project out flows and debt – related savings. In fact, DFCS transactions can mobilize funding for climate related projects without requiring additional indebtedness. And when they take the form of swap; they can be better adapted to the debt or country's cash flow need and timing.

Similarly, they can enable vulnerable countries to reduce their foreign exchange risks related to their external debt stock which contributes to the reduction of balance of payments pressures. Again, they can yield a multitude of climate and special benefits within a debtor countries thereby extending beyond their direct impact on ecosystem preservation and

enhancement. Indeed, DFCS can help vulnerable countries manage their debt burdens, free up fiscal space and support climate initiatives. However, DFCs are not a silver bullet even though, they can liberate resources for much needed climate action; they also require very specific conditions to be effective (especially at scale).

Structurally, they lend to be most promising in vulnerable countries that have high sovereign debt (and not yet in acute debt distress). Yet, in order to scale and maximize the usability of swaps; the process needs to be become more efficient and costs need to be brought down as appropriate. In other words, streaming can be done by developing the following set of operational principles as shown below:

A. Moving from individual (bilateral) deals to a collective or even multilateral approach. That is, pooling sovereign debt of multiple creditors to reach a greater scale and impact.

B. Using guarantees for credit enhancement risk for potential investors and allows vulnerable governments to issue highly credit rated (low risk) bonds. Essentially, this is critical for reaching a wider investor base like risk – averse institutional investors (such as pension funds and insurance companies). Similarly, higher credit ratings bring down interest rates as well as improving access to capital and lowering long run debt service costs.

C. Leveraging swaps for quality public and private investment. That is, switching and combining grants with financial instruments (such as loans, equity or guarantees) can generate returns that can be reinvested in additional development projects as well as attracting additional public and private investments from the public and private sector. Therefore, the key to scaling will be to move from a project based approach towards a pipeline of initiatives that can lead to systematic change and impact as well as generating systemic transformative changes and impact.

Finally, when it comes to project identification, implementation and monitoring; the following success factors are applicable: Proactive pipeline development and objective project Appraisal, Evidence of Strong Impact potential, viable project Design and Financing strategy, Projects Aligned with National Strategies and Policies, Diverse Stakeholder participation and knowledge Transfer, Effective Management and Oversight; Sustainable Funding Approach, Well Defined MRV (Monitoring, Reporting, Verification) Framework as well as Practical Feedback (Grievance), Mechanism. Indeed, as an integral component of robust governance frameworks, the adopted grievance mechanism should adhere to a well – defined process, remain accessible to all stakeholders as well as having defined targets for responsiveness measures. However, any debt for climate swaps (DFCS) success is contingent on context, transaction design and costs as appropriate.

7.0 POLICY CHALLENGES

Clearly, the impacts of climate change are intensifying at a pace that threatens the stability and development progress of economies worldwide. In fact, the increasing frequency and severity of extreme weather events (such as heat waves) and droughts to cyclones and floods) have profound implications for global economic and social systems. However, several developing countries are critically vulnerable due to their geography and resilience on climate – sensitive sectors (such as agriculture) as well as due to historical under investment in resilience – building and structural inequalities. Specifically, there is lack of well prepared (investment – ready) projects in key sectors like agriculture water and coastal infrastructure. Again, many vulnerable countries lack strong climate finance ecosystems capable of mobilizing, managing and tracking funds effectively. Unfortunately, many vulnerable countries are either in or at risk of debt distress. In other words, high debt servicing costs constrain public investment in adaptation.

Despite the above structurally challenges, vulnerable countries are home to several promising innovation and financing models that are transforming the adaptation landscape. Notably, innovative financial instruments (such as resilience bonds, insurance linked securities, debt for adaptation swaps as well as payments for ecosystem services are gaining traction. Essentially these tools diversify funding sources and offer performance linked incentives for resilience – building. Furthermore, governments are increasingly adopting tools like climate budget tagging, adaptation investment plans and sovereign green bonds to institutionalize adaptation within public financial management frameworks.

Similarly, sovereign debt instruments tied to adaptation outcomes offer countries a way to restructure debt while channeling investments into climate resilience. Yet, technical assistance to design, implement and monitor adaptation finance is critical so as to help unlock larger and more sustained flows of adaptation funding. Therefore, by building inclusive and resilient financing ecosystems, leveraging innovative instruments as well as ensuring country – driven ownership; global vulnerable countries (GVC) can demonstrate solutions for closing global adaptation finance gap. In other word, debt for- climate and debt – for – adaptation swaps are

gaining traction as mechanisms that alleviate sovereign debt burdens while funding investments in climate resilience. Thus, strategic partnerships between creditors, multilateral development banks and climate funds will be critical to sealing those instruments as well as ensuring that adaptation financing does not exacerbate debt vulnerabilities.

Even though, some GVCs have developed national climate strategies and integrated climate objectives into long-term development planning; implementation remains uneven. And to address the observed problem, more targeted investment is needed in governance systems, budget reform and institutional strengthening. Also embedding climate risk considerations into public investment management, agriculture, infrastructure and urban development policies is valuable. Yet, scaling these efforts will require international cooperation, domestic political will as well as greater alignment between climate, development and policy.

Consequently, these is urgent need for a development – oriented debt architecture to allow countries to sustainably borrow and invest in sustainable development as well as support to heavily indebt4ed vulnerable countries in need of immediate debt relief to return to debt sustainability path. In other words, rising debt service burdens and high costs of capital (exacerbated by recurrent external shocks) call for efforts to significantly lower the cost of borrowing as well as more comprehensive and systematic support for vulnerable countries that are burdened with high debt servicing costs. This implies that a more development-oriented international debt architecture in which all creditors effectively participate could ensure efficient fair, predictable, coordinated, timely and orderly restructuring.

And with full respect for independent mandates and governance bodies; the international community must work together to ensure that the international financial architecture becomes more efficient, equitable, fit for the world of today as well as remaining dynamic and responsive to challenges facing vulnerable countries. Thus, solutions are urgently needed which includes those related to global governance, global financial safety net, international financial regulation, international monetary system as well as global macroeconomic coordination and coherence. Specifically, global financial safety net must be expanded; have better coverage and be more reliable to allow vulnerable countries to expand their investment

in their sustainable development paths. Similarly, creating an effective financial regulatory framework that addresses social and environmental impact (coupled with effective climate policies) can generate both stability and sustainability.

Operationally, to address long – term financing needs; lending decisions should be based on long – term models of debt sustainability rather than simple rules of – thumb (such as arbitrary debt / GDP rations). In fact, the current World Bank / IMF Fund Debt Sustainability Analysis framework often advocates suboptimal government spending levels (that contributes to future distress). Therefore, the framework should balance development financing needs with maintaining manageable debt levels. In other words, investments in the green transition and economic growth should be incentivized as they support long – term debt sustainability.

Notably, there is critical need for a big investment push in those vulnerable countries. And without such an investment push, there is a high likelihood of a spiral of stagnant growth, declining capital inflows and higher risk premia which leaves developing countries vulnerable to natural disasters and related economic shocks. Unfortunately, these vulnerable countries often face some hurdles in implementing their strategy as follows:

A. Need to change mindsets to prioritize growth

B. Need to develop programmes of transformational change (with bankable investment project)

C. Need for a medium to long – term financing plan that is consistent with macroeconomic stability as well as with big investment push.

However, the relationship between layers of government often plays a critical role in enabling financing for adaptation in particular, they have crucial role in the provision of local infrastructure and response to climate events. Yet, they can be faced with significant financial and capacity constraints that hinder investment in adaptation and resilience which includes the following:

I. Fiscal frameworks that limit the ability of sub-national governments to raise revenue or borrow to finance economically worthwhile projects.

II. Lower capacity to manage their exposure to climate related risks which are due to geographic concentration and less diversified revenues;

III. As well as systems for allocating funding to local governments that do not account for climate risks.

Therefore, creating the conditions for investment accelerations and sustained improvements in longer – term growth in GVCs hinges on success in implementing well – designed and comprehensive policy package to foster stability, enhance resilience and capitalize on vulnerable countries and advantages. Fundamentally, such policy packages should encompass fiscal, monetary and external policies as well as deep – seated structural changes. Yet, the details and appropriate sequencing will depend on country – specific circumstances and characteristics. Here, particular attention should be given to reforms to strengthen fiscal credibility and creating policy space; improving frameworks and institutions (such as those that support effective capitalization of natural resources) as well as improving education and health outcomes (which can help to leverage countries demographic advantages).

Consequently, an overarching challenge for GVC policy makers is ensuring that reform packages are implemented in a sustainable (durable) format. Again, as underpinning those priorities; stability and resilience are often important to development progress but can also prove elusive. Surely, stability and resilience matter in a purely economic sense but can also be linked to societal stability and capacity to respond effectively to shocks.

In other words, fostering stability and resilience requires building institutional strength in the broadest sense; which remains a significant challenge for many global vulnerable countries. Indeed, this is the time to act positively as identified.

8.0 CONCLUSION

Clearly, global vulnerable countries (GVC) face several arrays of persistent development challenges that the COVID – 19 pandemic and subsequent crisis have significantly enhanced. In fact, advances in reducing extreme poverty in vulnerable countries have stalled after years of difficult progress. Furthermore, debt vulnerabilities and mounting debt servicing costs have darkened the outlook for these countries. Similarly food insecurity in those countries has surged while the income gap between many GVCs and the rest of the world looks set to widen further. Unfortunately, this constitutes a structural reversal in the development process. Specifically, climate related vulnerabilities pose growing challenges for these countries and thus, broader measures (beyond economic policy reforms) may be necessary to foster stability for those countries affected by persistent fragility and conflict. Therefore, urgent action may be needed to avoid further deterioration, accelerate progress and chart a course toward a brighter future.

Operationally, optimal interventions and their sequencing will differ from country to country. Yet, key actions often include enacting fiscal reforms to strengthen discipline and contain deficits; enhancing the credibility of fiscal policy creating space for investment; as well as stronger governance and institutional frameworks. However, without comprehensive domestic policy interventions (and global support) development objectives in vulnerable countries will fall beyond expectations. Notably, escalating debt – servicing costs has little space for GVCs to expedite the investment agenda in the short – term (which potentially compels many to reduce essential expenditures on critical sectors). Clearly, this situation not only jeopardizes their immediate development but also risks erosions to their long – term growth prospects.

Yet, the job of finance is to bring the fruits of those technological advances to the benefit of all of humanity (including vulnerable countries in conflict zones and places hard hit by the ravages of high – intensity tropical cyclones, droughts, floods, heat waves and forest fires (that arrive with ever – greater frequency as the result of human – induced climate change). Thus, as powerful solutions (zero – carbon energy, open source artificial intelligence,

precision agriculture and biodiversity conservation) we should undertake needed investments to bring those solutions to bear as appropriate.

Again, in their Debt Sustainability framework (DSF) and Credit Rating (CR), the World Bank (WB), International Monetary Fund (IMF) and Credit Rating Agencies (CRA) should try to revamp their methodologies to take into account of the following:

A. High potential growth of poorer countries (GVCs) where they have access to the necessary financing for development.

B. Maturity structure of the loans (given higher credit ratings and debt – sustainability assessments to long term loans);

C. Quality of country's debt management systems;

D. Presence of domestic and international lender of last resort;

E. And the uses of external financing while recognizing the growth creating benefits of high – return investments in human capital and physical infrastructure.

Ecologically, United Nations member states must increase their financing of the global commons (inclusive of the biodiversity of the world's tropical rainforests, marine life of the oceans and the protection of the atmosphere, fresh water, soils, coastlines, wetlands) as well other ecosystems from trans-boundary pollution and global – scale degradation. Essentially, the high – income countries should have the responsibility to fill the funds they have designated for these purposes (such as adaptation fund, losses and damages fund, green climate fund, etc.). Similarly, there is need to further advancing the work on ways to address liquidity challenges. This shall include additional discussions on the developments international financial conditions as well as the respective roles of multilateral, bilateral and private sector partners to address liquidity challenges and further work on liability management operations (inclusive of debt swaps and debt buy back).

However, work on transparency should include discussions on adopting transparency clauses whereby borrowers and creditors commit to heightened disclosure levels) to restructuring agreements as well as identifying measures to improve the exchange of loan information between creditors, borrowers and international financial institutions. Clearly, this is with a view to increase transparency of data accuracy as well as reducing the time required for debt reconciliation in cases of restructuring.

Technologically, the fundamental question (at this juncture) is no longer whether machines will broadly match human intelligence, but when. In other words, how might CENTRAL BANKS (keepers of monetary and financial stability) respond to the observed technological changes? Using artificial intelligence and machine learning systems, central bank of GVCs can now rapidly and continuously collects diverse data (from traditional economic matrices and real – time spending patterns to environmental indicators. Here, they can instantly evaluate various scenarios to predict policy impacts and conducts ongoing stress tests to identify threats like cyber-attacks, natural disasters and geopolitical crises (proactively addressing manageable risks before escalation). However, the realistic and effective adoption of artificial intelligence frameworks requires recognizing that human systems (rules, behaviors, norms) may fundamentally shape technological systems while determining their ultimate form and functions.

In fact, artificial intelligence might structurally alter traditional economic frameworks. In other words, the conventional dynamics of supply, demand and price mechanisms may diminish in importance by way of challenging the very essence of monetary policy and central banking. Thus, addressing the emerging transition calls for realistic assessments of artificial intelligence impacts and adjustments to our rules, institutions and norms for the sake of economic stability preservation.

Essentially, a constructive approach to addressing the obstacles facing GVCs in seeking brighter future must involve much greater global support and cooperation.

In other words, collaborative efforts and sustained (stable) well – targeted support are critical to driving meaningful charge as well as advancing the collective prosperity of those

vulnerable countries and global community. Specifically, enhanced international cooperation is required to tackle the threats that climate change poses; by adopting debt for climate swap (DFCS) frameworks. Finally, progress across all recommended measures is imperative for giving GVCs the best possible chance of unwinding the reversals being experienced as well as breaking free from their current bleak trajectory and embarking on brighter development goals. Surely, the future is now.

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