



The compendium of
The COMESA Early Warning System (**COMWARN**)
Data and Data Sources

A Component of The COMWARN Toolkit

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Supported by the EU through the APSA Support Programme





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Constituent Indicators of World Economic Forum category of indicators

Measurement or formulation

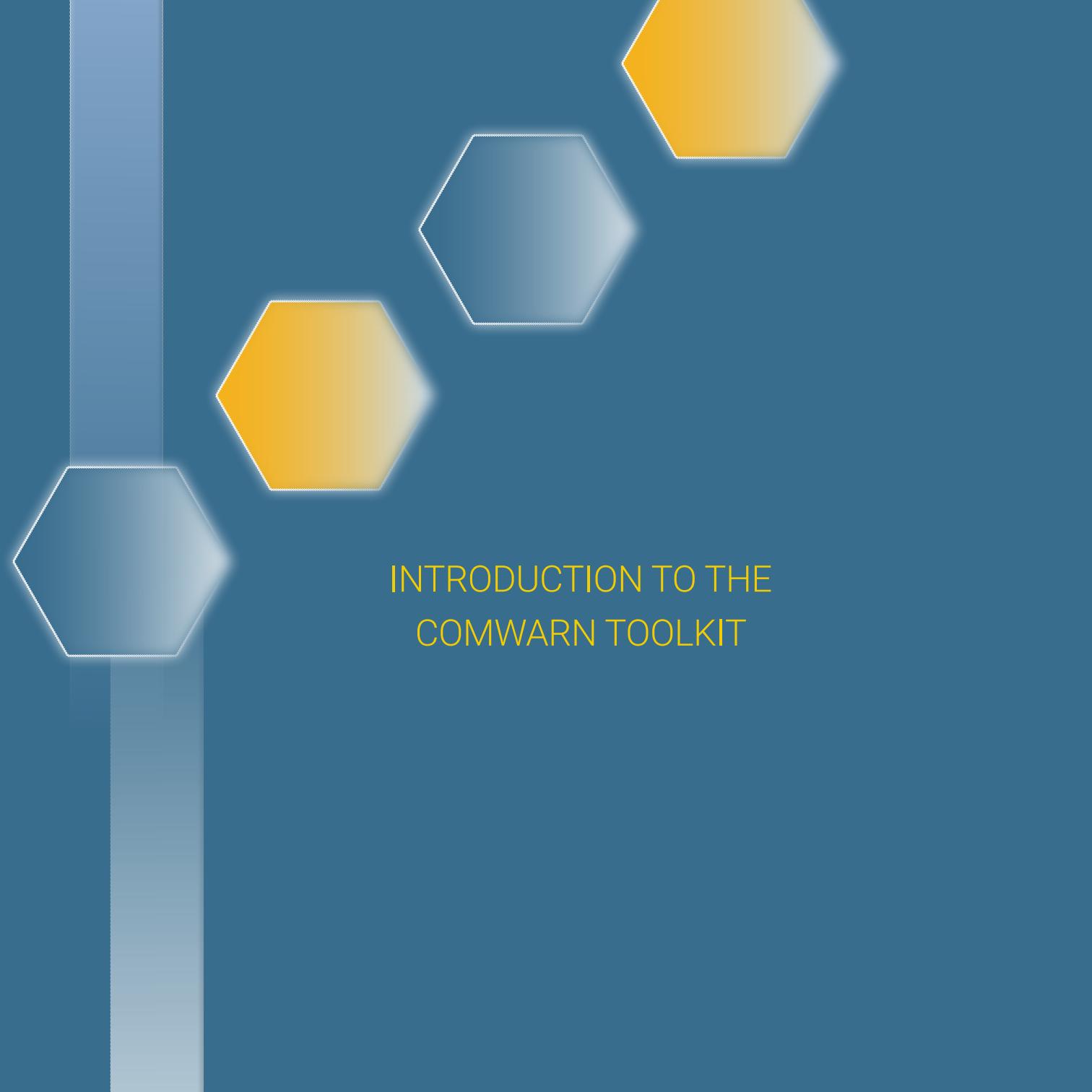
Limitation of data/ data source

Annex 1: COMWARN CANDIDATE INDICATORS FOR THE COMESA REGION

ABBREVIATIONS

APSA	Africa Peace and Security Architecture
AU	African Union
AUC	African Union Commission
BICC	Bonn International Center for conversion
AU CEWS	Continental Early Warning System of the African Union
COMESA	Common Market for Eastern and Southern Africa
GPS	The Governance, Peace and Security unit in COMESA
COMWARN	COMESA Early Warning System
CPPI	COMESA Peace and Prosperity Index
CRED	Center for Research on the Epidemiology of Disasters
CSP	Center for Systemic Peace
FAO	Food and Agricultural Organisation
FDI	Foreign Direct Investment
FFP	Fund For Peace
FH	Freedom House
GDP	Gross Domestic Product
GIS	Geographical Information System
GMI	Global Militarisation Index
GNI	Gross National Income
HIHK	Heidelberg Institute of Conflict

IBRD	International Bank for Reconstruction and Development
ICT	Information and Communications Technology
IDA	International Development Association
IEA	International Energy Agency
IGAD	Inter-Governmental Authority on Development
IMF	International Monetary Fund
MIF	Mo Ibrahim Foundation
MIIAG	Mo Ibrahim Index on African Governance
OECD	Organisation for Economic Cooperation and Development
PPP	Purchasing Power Parity
REC	Regional Economic Community
RM	Regional Mechanism
SIPRI	Stockholm International Peace Research Institute
SVA	Structural Vulnerability Assessment
TI	Transparency International
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
V-DEM	Varieties of Democracy
VRA	Virtual Research Associates
WB	World Bank
WEF	World Economic Forum
WHO	World Health Organisation
WTO	World Trade Organisation

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INTRODUCTION TO THE
COMWARN TOOLKIT

The COMWARN toolkit is a comprehensive publication that comprises three separate documents for use by COMESA COMWARN analysts to undertake COMWARN SVAs and to develop early warning reports for dissemination to member states. The toolkit is also useful for Member States and other RECs that may wish to incorporate the COMWARN methodology in their respective national or regional early warning systems.

2 | The toolkit includes a primer on the COMWARN Structural Vulnerability Assessment (SVA) methodology, a description of the data and a manual on Conflict Analysis and Report writing¹.

The two components of this toolkit, the “Primer on SVAs” and the “COMWARN Data and Data Sources” are considered as “living documents” because the COMWARN SVA methodology is still relatively new particularly the use of a composite indicator for the target. It is noted that the COMESA Ministers of Foreign Affairs, in their 15th Meeting which was held in Antananarivo in 2016 called on the Secretariat to continue to improve the model; while in July 2018 the Ministers, in their 16th Meeting which was held in Lusaka called on the Secretariat to mobilize Resources to incorporate the analysis of dynamic data into the model. Similarly, with regard to the data, the 13th Meeting of the Ministers of Foreign Affairs, which was held in Kinshasa in February 2014 adopted the data and the use of the global data sources, and they urged the Secretariat and Member States to “review and validate the data on a regular basis”. It is therefore expected that as these decisions are progressively implemented, the Primer and the COMWARN Data and Data sources will continuously be updated.

The Primer on Structural Vulnerability Assessments and Guide to the African Prospects Tool as implemented by COMESA COMWARN

The Primer introduces SVAs as well as provides an overview of the Africa Prospects software tool as developed by the African Union to assess structural vulnerabilities of countries. It provides the key features of the African Prospects. The Primer further highlights the customization of the Africa Prospects by COMESA to undertake SVAs for a composite target, the COMESA Peace and Prosperity Index (CPPI). The bulk of the Primer is a detailed ten-step process of conducting COMWARN SVAs, including the specification of the Target Variable, the selection of the Explanatory Variables, the compilation of indicator data sets, building and running the model, comparing results, collating results from the forecasted levels of CPPI, the identification of country-

¹ The COMESA programme on Peace and Security recognizes with appreciation, Professor Doug Bond from Harvard University for the development of the “Primer” and Dr. Martha Mutisi from IDRC for the development of the “Manual on Conflict Analysis and Report Writing”.

specific indicators and their associated levels of CPPI, evaluation of the forecasts, and the formulation of actionable recommendations to mitigate structural vulnerabilities.

The Compendium of COMWARN Data and Data Sources

This is a compilation of the global data sources as used by the COMWARN model. It details the twelve data sources including a description of the indicators derived from these sources. It provides such information as the name of the indicator as used by the developer and the name as used by COMWARN, and the basket in which the indicator fits. A brief description is given on the data source, the methods used to develop the indicator, the relevance of the indicators to peace and prosperity and any limitations of the indicator with respect to its usage to support the analysis. Out of the twelve data sources, COMWARN gets 97 of its 144 indicators from three data sources, the World Bank (64), the World Economic Forum (16) and the Mo Ibrahim Foundation (14). Therefore, the description of indicators from these sources is less detailed than the indicators sourced from the other nine sources. The document is supported by two annexes, the first contains the “Candidate Indicators” for COMWARN that were adopted by the 11th Meeting of the COMESA meeting of the Ministers of Foreign Affairs that was held in Lilongwe in October 2011. This followed the identification of common structural factors that affect COMESA peace and prosperity. The second annex provides a listing of all 144 indicators with a brief description of each.

The Manual for Conflict analysis and report writing

The manual is developed for use by any practitioners in the field of conflict prevention and peace building including students of peace studies. In addition, any person involved in developing early warning reports, mediation or mediation-related roles needs to have a good understanding of conflicts and their dynamics.

This introduction therefore serves to introduce the complete COMWARN toolkit to the reader noting and in view that some of the components can be used on their own. The introduction provides the reader information on the other components of the Toolkit and thus encourages the reader to consult the other components for a better understanding of the COMESA conflict early warning system.

Elizabeth Mutunga

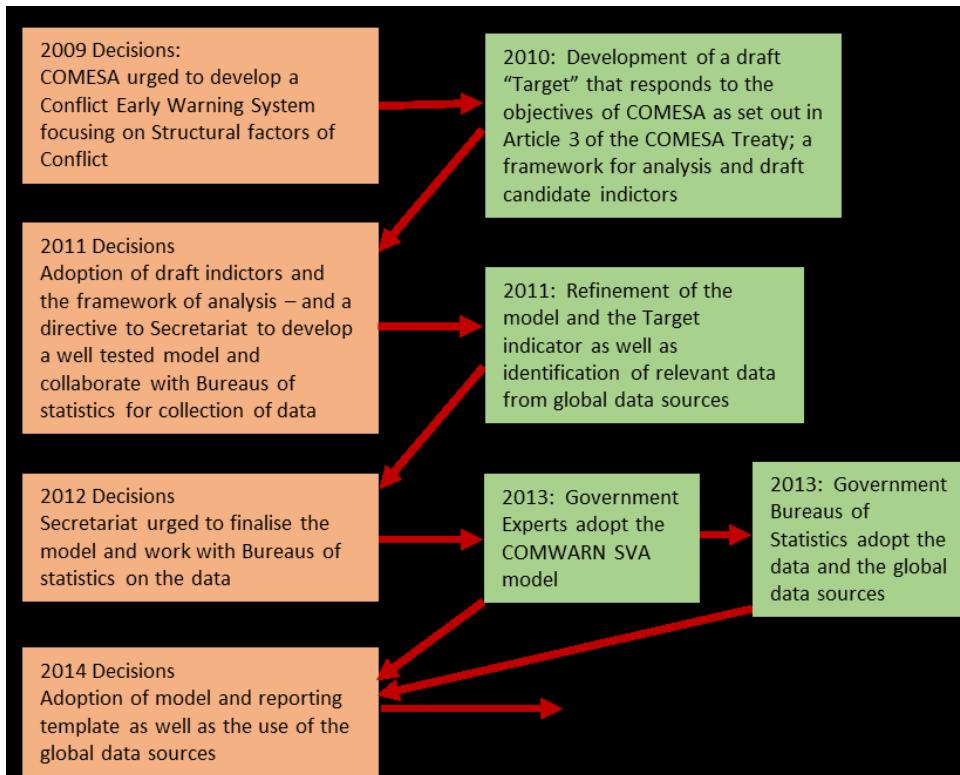
Head of Governance, Peace and Security

BACKGROUND

The Ninth Meeting of the Meeting of Foreign Affairs held in Victoria Falls in Zimbabwe in June 2009 called on COMESA to develop its early warning system curved around the niche of economic factors related to conflict and economic decline.

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The development of the early warning system started with the development of a framework of analysis and the identification of the target indicator, the COMESA Peace and Prosperity index. This was done through thorough interrogation of the factors contained in the objectives of COMESA as set out in Article 3 of the COMESA Treaty and it was supported by econometric modelling. For the explanatory variables, the programme identified common country vulnerability factors in COMESA, which were used to develop candidate indicators. Upon adoption of the candidate indicators and a draft framework for analysis by the Policy Organs, the Secretariat working with government experts refined the model and the framework of analysis. The Secretariat also collaborated with the Bureaus of statistics of the member states to finalise the identification of data for the model. The revised framework of analysis and the use of the global data sources was adopted by the 13th Meeting of COMESA Ministers of Foreign Affairs, which was held in Kinshasa in February 2014. COMESA started to develop and disseminate COMWARN SVAs to member states in 2015.



The Target Indicator

The identification of the Target was done to satisfy the objectives of the COMESA Treaty as stipulated in Article 3. This is because a close interrogation of the elements of Article 3 point to the objectives of realisation of peace and prosperity of the region. The six elements contained in Article 3 of the Treaty are as follows:

- a. To attain sustainable growth and development of Member States by promoting a more balanced and harmonious development and production of its marketing structures;

- 6 |
- b. To promote joint development in all fields of economic activity and the joint adoption of macro-economic policies and programmes to raise the standard of living of its peoples and to foster closer relations among its member States;
 - c. To cooperate in the creation of an enabling environment for foreign, cross-border and domestic investment including the joint promotion of research and adaptation of science and technology for development
 - d. To cooperate in the promotion of peace, security and stability among Member States;
 - e. To co-operate in strengthening the relations between the Common Market and the rest of the world and the adoption of common positions in international fora; and
 - f. To contribute towards the establishment, progress and the realisation of the objectives of the African Economic Community.

It was clear that no single indicator could be used to encompass all peace and prosperity factors that are contained in Article 3. Analysis done by experts in the field of economics and development as well as peace and security identified the most appropriate indicator(s) that exhibited the closest link to the objectives of COMESA. From the expert analysis a combination of indicators pertaining to Peace, Health, Wealth and Trade openness were identified as most appropriate for the target. Tests, simulations and trials on different indicators and relative weighting of each were done resulting in an index, the COMESA Peace and Prosperity Index (CPPI).

The Explanatory indicators

Country Vulnerability Assessments were done for 18 Member States and used to identify common factors that affect peace and economic prosperity in the region. These were adopted as candidate indicators and they formed the basis of identifying the appropriate explanatory indicators from global open data sources for the model. This was done in line with requirements of the Structural Vulnerability Assessment (SVA) methodology. The indicators are categorised into eight (8) thematic baskets namely; economy, education,

environment, governance, health, military, security and social.

The main consideration for data that can be usable in the model include:

- a. It should have sufficient data over time, at least 50% data availability;
- b. Be freely and easily accessible;
- c. Have time-series data spanning at least 10 years into the past;
- d. Maintain a consistent and verifiable methodology in their collection;
- e. Maintain relevance over time; and
- f. Be reliable and valid.

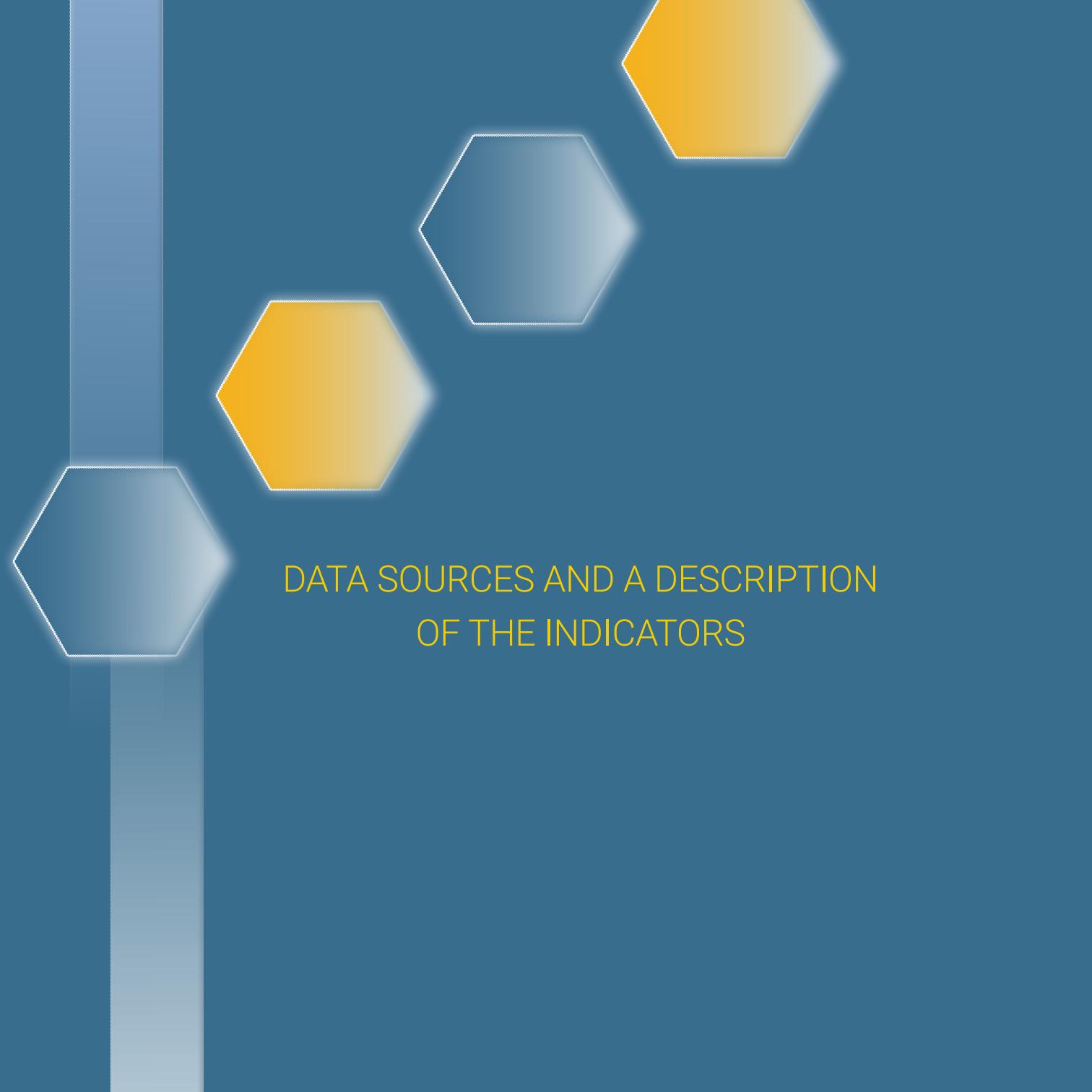
It is further noted that where possible:

- Sub-components of some indicators are used instead of the original aggregated components/index. For example, using the Military personnel, Military expenditures and Heavy Weapons sub-indices instead of the aggregated Global Militarisation index. This would allow in-depth explanations of associations with the CPPI and other explanatory indicators;
- Indicators are disaggregated by age cohorts, geographical location, gender and also including specific gender issues;
- Proxy indicators are used to cover the gaps in the model;

The Global Data Sources

COMWARN derived the majority (over 67%) of its SVA indicators from the World Bank; the reason and advantage being that the majority WB data is collected and provided by individual countries, including Member States of COMESA, as confirmed by COMESA Bureaus of Statistics in 2013.

8 | The first run of the model used 81 indicators, that included four indicators that make up the target, the COMESA Peace and Prosperity Index (CPPI) and 77 explanatory indicators. After the disaggregation of some of the indicators in 2015, the second run of the model used 79 explanatory indicators and continued to explore for indicators from African Sources that comply to the requirements of the model. By 2017 the Mo Ibrahim Index on African Governance and the World Economic Forum (WEF) had enough time-series data and therefore a run was made using 140 explanatory variables.

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DATA SOURCES AND A DESCRIPTION
OF THE INDICATORS

This section will provide a description of the indicators from the data sources and the linkages to peace and prosperity as well as other information including any limitations of the data on the model.

The data sources covered include:

- a. Bonn International Centre for Conversion (BICC)
- b. Centre for Research on the Epidemiology of Disasters
- c. Centre for Systemic Peace (CSP)
- d. Freedom House (FH)
- e. Fund for Peace (FFP)
- f. Heidelberg Institute of *Konflikt* (HIK)
- g. Mo Ibrahim Foundation (MIF)
- h. Transparency International (TI)
- i. Varieties of Democracy (V-DEM)
- j. Virtual Research Associates (VRA)
- k. World Bank (WB)
- l. World Economic Forum (WEF)

The Bonn International Centre for Conversion

Brief Details on Indicator(s)		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
Global Militarization Index (GMI)	Global Militarization Index (GMI)	Economy Governance Military Security

Brief Description of the Data Source

The Bonn International Centre for Conversion (BICC) established in 1994 as a research institute located in Bonn, Germany compiles the Global Militarisation Index (GMI) on an annual basis. In its work, BICC uses data from the Stockholm Peace Research Institute (SIPRI), the International Monetary Fund (IMF), the World Health Organisation (WHO), the International Institute for Strategic Studies (IISS) and BICC. The index presents the relative weight and importance of a country's military apparatus in relation to its society. The Index has been produced since 1994 and it has continued to show the levels of militarisation of more than 150 countries. BICC provides updates on an annual basis. COMWARN uses indicators drawn from the three sub-indices of the GMI namely GMI Heavy Weapons, GMI Military Expenditures and GMI Military Personnel to obtain detailed and disaggregated data on militarisation.

Measure or formulation of indicator(s)

As part of the GMI, the three sub-indices are used by COMWARN. These are ratios and they consist of the following:



Table 1.1 Sub-Indices of the GMI and Components	
SUB-INDEX	COMPONENTS
GMI Military Expenditures sub-index	<ul style="list-style-type: none"> • Military expenditures as percentage of GDP is allocated a weight of 5; and • Military expenditures in relation to health spending is allocated a weight of 3.
GMI Military Personnel sub-index	<ul style="list-style-type: none"> • Military and paramilitary personnel in relation to population is allocated a weight of 4; • Military reserves in relation to population is allocated a weight of 2; and • Military and paramilitary personnel in relation to physicians is allocated a weight of 2.
GMI Heavy Weapons sub-index	<ul style="list-style-type: none"> a. Heavy weapons in relation to the overall population which is allocated a weight of 4

To increase the compatibility between different indicators and to prevent extreme values from creating distortions when normalizing data, BICC undertakes three critical steps and considerations:

- i. Every indicator is represented in a logarithm with the factor 10;
- ii. All data is normalized using the formula $x=(y-min) / (max-min)$, with *min* and *max* representing the lowest and the highest value of the logarithm, respectively; and
- iii. Every indicator is weighted in accordance to a subjective factor, reflecting the relative importance attributed to it by BICC researchers.

Relevance to Peace and Prosperity and linkages with other SVA indicators

The GMI Heavy Weapons, GMI Military Expenditures and GMI Military Personnel indicators used by COMWARN show levels of militarisation in countries and relative resource allocations to the military in comparison to other key sectors that include health, education, economy, social welfare, among others, that may have a

bearing on peace and prosperity. Out of the more than 150 countries included in BICC research, BICC often analyses the top ten countries each year ranking highest in militarisation and makes a relative comparison between allocations of resources to the armed forces *vis a vis* other key sectors.

The major challenge of BICC’s criteria is the need to empirically prove beyond doubt whether high militarisation has a negative impact on society as a whole on a country basis. According to BICC and other research organisations, militarisation alone is not a monocausal phenomenon because the degree of militarisation in a society is dependent on varying factors and conditions. Therefore, there is need to take caution when analysing indicators on militarisation and to also avoid the normative assumption that militarisation is always associated with an excessive emphasis on military power, or that a high allocation of resources for the military generally has a negative impact on the development of society as a whole.

On the other hand, low levels of militarisation must not necessarily be viewed as something positive as they may often (but not always) be an indicator of deficits in the security sector that can occur in the context of weak state institutions.

The Centre for Research on the Epidemiology of Disasters (CRED)

Brief Details on Indicator(s)		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
Killed	Disaster Killed	Security
Affected	Disaster Affected	Social
Occurrence	Disaster Occurences	
Disaster Number	Disaster	

Brief Description of the Data Source

The Centre for Research on the Epidemiology of Disasters (CRED) is a research unit of the University of Louvain located in Brussels, Belgium. In 1988 CRED developed the Emergency Events Database (EM-DAT) to capture data systematically to assist its consumers to rationalise decision-making for disaster preparedness, while



also providing an objective base for vulnerability assessment and priority setting. EM-DAT contains essential core data on the occurrence and effects of over 18,000 mass disasters all over the world, running from 1900.

CRED classifies disasters into five categories namely, Geophysical, Meteorological, Hydrological, Climatological and Biological. When a disaster occurs, the related information is entered into the Emergency Events Database (EM-DAT) at three different levels that include the event/disaster level, the country(ies) level and the sources level. COMWARN uses four indicators from EM-DAT.

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Measure or formulation of indicator(s)

- a) **Disaster Affected:** This indicator aggregates data for those injured, homeless, and affected (includes people requiring immediate assistance during a period of emergency; it can also include displaced or evacuated people) by accidents and natural disasters having 1) ten or more people reported killed, 2) one hundred or more people reported affected, 3) a declaration of a state of emergency or 4) a call for international assistance per episode.) For COMWARN's use, the number of those affected are recorded for each country-year and then normalized by the mid-year population (from World Bank) before being multiplied by one million. The formula is as follows: $((\text{Affected} / \text{pop}) * 1 \text{ Million})$
- b) **Disaster Killed:** This indicator captures data of those killed by accidents and natural disaster events having 1) ten or more people reported killed, or 2) one hundred or more people reported affected, or 3) a declaration of a state of emergency or 4) a call for international assistance per episode. For COMWARN's use, the number of those killed is recorded for each country-year and then normalized by the mid-year population (from World Bank) before being multiplied by one million. The formula is as follows: $((\text{Killed} / \text{pop}) * 1 \text{ Million})$.
- c) **Disaster Occurrence:** This indicator includes CRED-reported natural disasters and accidents. For COMWARN's use, the number of occurrences are recorded for each country-year and then normalized by the mid-year population (from World Bank) before being multiplied by one million: The formula is as follows: $((\text{Occurrences} / \text{pop}) * 1 \text{ Million})$.

- d) **Number of Disasters.** This is a raw count of all discrete CRED-reported natural disasters and accidents. The number of occurrences are recorded for each country-year

Relevance to Peace and Prosperity and linkages with other SVA indicators

When a disaster occurs, it normally leads to the injuries, displacement, deaths of people and also loss of personal possessions. Families and communities can break apart due to disasters. Whilst some victims are internally displaced, some migrate to other countries as refugees. The cyclones that affected Zimbabwe, Mozambique, Malawi and Comoros in 2019 are a case in point. The resultant humanitarian crisis contributed to hunger, sanitation challenges, spread of communicable diseases and unexpected hardships. Where people migrate to when they are displaced is also of concern. If not managed well it might accentuate conflicts with the inhabitants of those areas. Often, Governments and other humanitarian agencies provide support to take care of the deceased and survivors who need food, water, accommodation and sanitary facilities.

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Limitations of the data/ data source

For a disaster to be entered into the EM-DAT database, at least one of the following criteria must be fulfilled:

- a) Ten (10) or more people reported killed.
- b) Hundred (100) or more people reported affected.
- c) Declaration of a state of emergency.
- d) Call for international assistance.

The Centre for Systemic Peace (CSP)

Dataset Details		
Category of dataset	Sub-Datasets available from CSP	CSP sub-datasets used by COMWARN
1: Armed conflict and intervention dataset	a. Forcibly displaced populations (from 1964) b. Major episodes of political violence (from 1946) c. PIF State failure problem Set (from 1955) d. High Casualty Terrorist Bombing (from 1989) e. Memberships in Conventional IOs (from 1952)	a. Not used b. Not used c. Not used d. High Casualty Terrorist Bombing e. Not used
2: Polity V – Regime Authority Characteristics and Transitions dataset	a. Polity V Annual Time-Series data (from 1800) b. Polity Vd Polity-Case Format (from 1800) c. Coup d’Etat (from 1946)	a. Polity V Annual Time-Series data b. Not used c. Not used
3: State Fragility Index and Matrix	a. State Fragility Index and Matrix b. State Fragility Index and Matrix, Time Series Data (from 1995)	Not used State Fragility Index – Time Series Data
4: Conflict in India Dataset	a. Crime in India: Riots, Murders and Dacoity (from 1954) b. India Sub-National Problem set (from 1960)	Not used

Brief Description of the Data Source

The Centre for Systemic Peace that was established in 1997 develops methodologies to track global and regional trends in conflict management. It has developed four overarching datasets. Out of these, COMWARN draws indicators from the Armed Conflict and Intervention sub-dataset, Polity V sub-dataset, the Regime Authority Characteristic and Transition sub-dataset, and the State Fragility Index and Matrix sub-dataset as detailed below.

- a. The High Casualty Terrorist Bombings (HCTB) sub-dataset is drawn from the Armed Conflict and Intervention Dataset and it contains more than 1,367 cases of bomb attacks on non-combatant (civilian and political) targets by non-state actors resulting in 15 or more deaths that were recorded since 11th September 1989.

- b. The Polity IV dataset, contains a binary measurement of democracy and autocracy, constructed by Monty G. Marshall, Ted Robert Gurr and Keith Jagers (2007). It analyses political regime characteristics and transitions. From the State Fragility Index and matrix, COMWARN uses eight indicators which are sub-components of the SFI. Data for these indicators is compiled for 167 countries with populations greater than 500,000. Countries are assigned scores on both Effectiveness and Legitimacy in four performance dimensions:
 - i. Security: Security effectiveness and Security legitimacy

 - ii. Political: Political effectiveness and Political legitimacy

 - iii. Economic: Economic effectiveness and Economic legitimacy

 - iv. Social: Social effectiveness and Social legitimacy



Brief Details on Indicator(s)			
Data set	Source Indicator name	COMWARN Indicator name	COMWARN Basket
HCTB	Death	Bomb deaths	Security
Polity V	Democ	P4 Democracy	Governance and Security
	Autoc	P4 Autocracy	
	Durable	P4 Durability	
State Fragility Index	Seceff	SFI Security Effectiveness	Governance and Security
	Secleg	SFI Security Legitimacy	
	Poleff	SFI Political Effectiveness	
	Polleg	SFI Political Legitimacy	
	Ecoeff	SFI Economic Effectiveness	
	Ecoleg	SFI Economic Legitimacy	
	Soceff	SFI Social Effectiveness	
	Socleg	SFI Social Legitimacy	

Measure or formulation of indicator(s)

- a. For “High Casualty Terrorist Bombings (HCTB)” HCTB records the number of non-combatants (civilian and political) targets killed (15 or more deaths) by terrorist bombings. The bomb deaths data is collected on a monthly basis and also indicates the location of the incident. In the COMWARN Model, the data is aggregated annually for each country affected.
- b. For “Polity IV” dataset annual measurements for democracy (DEMOC), Autocracy (AUTOC) and Durability (DURABLE) are used (Marshall and Jaggers, 2007:13). Democracy consists of four critical, interdependent elements that encompass competitiveness of executive recruitment, competitiveness of political participation, constraint on the chief executive and openness of executive recruitment. The same elements are used to measure the degree of polity autocracy, but they go further to add the element of regulation of participation. The third indicator listed in this section; DURABLE, provides a running measure of the durability of government’s authority

pattern for a given year, that is, the number of years since the last substantive change in authority characteristics.

- c. For “State Fragility Index” each of the eight indicators is rated on a four-point fragility scale: 0 “no fragility,” 1 “low fragility,” 2 “medium fragility,” and 3 “high fragility” with the exception of the Economic Effectiveness indicator, which is rated on a five-point fragility scale (including 4 “extreme fragility”). In the COMWARN model, this scale is inversed to facilitate consistent polarity interpretation. Therefore, after the inversion, a high score represents high (legitimacy or effectiveness) and vice versa.

Relevance to peace and prosperity and linkages with other SVA Indicators

- a. For High Casualty Terrorist Bombings (HCTB): High incidences of terrorist attacks reflect the high level of insecurity within a country. The insecurity occasioned by terrorist attacks has serious economic ramifications, that in the long run impacts on peace and prosperity. For instance, high incidences of terrorist attacks lead to travel restrictions to the affected areas, which has a negative impact on the tourism industry. This impact is much more amplified in countries that are highly dependent on tourism as a source of revenue.
- b. The “Polity IV” dataset: One of the objectives of research on these indicators by CSP was to determine which authority traits characterised the more durable political systems, in different regions and in different historical paradigms. Through CSP’s research the following was revealed:
 - i. There was no absolute theoretical linkage between polity autocracy and polity democracy on the one hand, and polity durability on the other hand;
 - ii. The most durable polities were the ones which had experienced a number of minor or gradual changes in authority characteristics; and
 - iii. Polities which had internally consistent (“coherent”) democratic or autocratic traits tended to be more durable than polities characterised by mixed authority traits.

The above findings are important in explaining traits in a political system that determine and influence the durability of a political system, a factor important for enhancing peace and prosperity.

- c. For the “fragility index”: A country’s legitimacy and effectiveness is closely associated with government’s capacity to manage conflict, formulate and implement public policies and deliver essential services. It is also related to a government’s systemic resilience in maintaining system coherence, cohesion, high quality of life, capacity to respond effectively to challenges and crises, and sustaining progressive development. A country classified as low in legitimacy or effectiveness cannot effectively execute the above-highlighted functions, thus, impacting on its peace and prosperity. On the other hand, a country that is resilient (high on effectiveness and legitimacy) is inclined to execute the functions above effectively, thus, enhancing its resilience which is vital for enhancing peace and prosperity.

Limitations of the data/ data source

- a. For “High Casualty Terrorist Bombings (HCTB): This indicator is limited in that:
 - i. It only focusses on non-combatants (civilian and political targets);
 - ii. It does not take into account police/ military casualties and deaths as a result of terrorist bomb attacks, including on such peacekeeping forces like the African Union Mission to Somalia (AMISOM); and
 - iii. Only incidents with 15 or more deaths are captured.
- b. For “Polity IV”: The indicators are too broad to cover the more specific tenets of a Government’s authority data. To circumvent this, COMWARN uses indicators from other global datasets that cover the more specialised areas of a Government’s authority data.
- c. For “State Fragility Index”: No significant limitations were identified on the indicators of this dataset.

Freedom House (FH)

Brief Details on Indicator(s)		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
a. Associational Organisational Rights	a. FIW Associational and Organisational rights	Governance
b. Freedom of Expression and Belief	b. FIW Freedom of Expression and Belief	
c. Personal Autonomy and Individual Rights	c. FIW Personal Autonomy and Individual Rights	
d. Rule of law	d. FIW Rule of Law	
e. Electoral Processes	e. FIW Electoral Process	
f. Functioning government	f. FIW Functioning Government	
g. Political Pluralism and Participation	g. FIW Political Pluralism and Participation	

Brief Description of the Data Source

Freedom House measures freedoms by assessing the condition of political rights and civil liberties around the world. The measure is composed of numerical ratings and supporting descriptive texts for 195 countries and 14 territories. Freedom House’s “Freedom in the World” methodology is derived in large measure from the Universal Declaration of Human Rights, adopted by the UN General Assembly in 1948. The methodology is based on the premise that these standards apply to all countries and territories, irrespective of geographical location, ethnic or religious composition, or level of economic development. Freedom House operates from the assumption that freedom for all people is best achieved in liberal democratic societies. Reports from Freedom House that have been published since the 70s have allowed Freedom House to track global trends in freedoms for over 40 years. Freedom House has become the most widely read and cited report of its kind, used on a regular basis by policymakers, journalists, academics, activists, and many others.

The first runs of COMWARN SVAs used aggregated Civil Liberties and Political Rights indices but these were later discovered to be limited, thus, subsequent runs used the disaggregated values of these two indices. This was found to be more beneficial because it provided more detailed indicators on political rights and civil liberties. To achieve this, three indicators of political rights (Electoral Process, Political Pluralism and



Participation, Functioning of Government) and four indicators from the civil liberties index (Associational and Organisational Rights, Freedom of Expression and Belief, Personal Autonomy and Individual Rights, Rule of Law) were incorporated into the COMWARN SVA model.

Measure or formulation of indicator(s)

Through the “Freedom in the World” methodology, Freedom House evaluates the state of freedom in 195 countries and 14 territories. As part of its methodology, each country and territory are assigned a score between 0 and 4 points on a series of 25 indicators, for an aggregate score of up to 100. These scores are used to determine two numerical ratings, one for political rights and the other for civil liberties.

Relevance to peace and prosperity and linkages with other SVA Indicators

The level of political rights and civil liberties enjoyed by citizens in a particular country has an impact on the peace and prosperity. Where restrictions to freedoms exist, it is likely that high levels of repression may be applied, and this is directly linked to the level of democracy and rule of law in a country. Democracy and the rule of law are the fundamental ingredients to the peace and prosperity of any nation.

Limitations of the data/ data source

Freedom House assesses the real-world political rights and freedoms enjoyed by individuals, rather than governments or government performance *per se*. Political rights and civil liberties can be affected by actions of both state and non-state actors, including insurgents and other armed groups.

The Fund for Peace (FFP)

Brief Details on Indicator(s)		
Source indicator name	COMWARN indicator name	COMWARN Basket
C1: Security Apparatus	FSI Security Apparatus	Economy Governance Security
C2: Functionalised Elites	FSI Functionalised Elites	
C3: Group Grievance	FSI Group Grievance	
E1: Economy	FSI Economy	
E2: Economic Inequality	FSI Economic Inequality	
E3: Human Flight and Brain Drain	FSI Human Flight and Brain Drain	
P1: State Legitimacy	FSI State Legitimacy	
P2: Public Services	FSI Public Services	
P3: Human Rights	FSI Human Rights	
S1: Demographic Pressures	FSI Demographic Pressures	
S2: Refugees and IDPs	FSI Refugees and IDPs	
X1: External Intervention	FSI External Intervention	

Brief Description of the Data and the Data Source

The Fund for Peace (FFP) provides annual reports on the Fragile States Index (FSI). The index is a valuable tool in highlighting not only the normal pressures that all states experience, but also in identifying when those pressures are outweighing a state's capacity to manage those pressures. By highlighting pertinent vulnerabilities which contribute to the risk of state fragility, the index makes political risk assessment and early warning of conflict accessible to policy makers and the public at large. The FSI traces its origins to the creation of FFP's Conflict Assessment System Tool (CAST), which was developed in the 1990s as a framework for policy makers and field practitioners to be able to better understand and measure conflict drivers and dynamics in complex environments.² COMWARN uses 14 indicators derived from the Fragile States Index (FSI).

Measurement or formulation

The index's rankings are based on twelve indicators of state vulnerability, grouped into four categories:

² Fragile States Index Annual Report 2019, p31 (www.fragilestatesindex.org)

Cohesion, Economic, Political, Social; and compiled from 178 countries. Each category consists of three indicators as follows:

- a. Cohesion Category – Security Apparatus, Functionalised Elites and Group Grievance;
- b. Economic Category – Economic Decline, Uneven Development, Human Flight and Brain Drain;
- c. Political Category – State Legitimacy, Public Services, Human Rights and Rule of Law; and
- d. Social and Cross-cutting Category – Demographic Pressures, Refugees and IDPs and External Intervention.

Values for the indicators in this dataset are calculated using a score of 0 - 10 where 0 represents low fragility whilst 10 represents the highest fragility.

Relevance to peace and prosperity and linkages with other SVA Indicators

The demographic pressures indicator considers pressures upon the state deriving from the population itself or the environment around it. Pressures from high population growth rates or skewed population distributions, such as a “youth or age bulge,” or sharply divergent rates of population growth among competing communal groups, can have profound social, economic, and political effects.

In addition, the economic decline and uneven economic development indicators consider factors related to economic decline within a country. As such, progressive economic decline of the society as a whole as measured by per capita income, Gross National Product (GNP), unemployment rates, inflation, productivity, debt, poverty levels, business failures, sudden drops in commodity prices, trade revenue, or foreign investment, and any collapse or devaluation of the national currency, inequality within the economy, structural inequalities based on groups (such as racial, ethnic, religious, or other identity group) or based on education, economic status, or region (such as urban-rural divide) can create polarities within a country. All these have a negative impact on economic growth and national cohesion

Limitations of the data/ data source

No significant limitations were identified on the indicators in this database.

The Heidelberg Institute of *Konflikt* (HIK)

Indicator Details		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
Conflict Barometer	Inverse of Conflict Barometer - Adjusted	Security

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Brief Description of the Data Source

The Conflict Barometer (CB) which is compiled by the Heidelberg Institute of *Konflikt* (HIK) employs a generalized measure of conflict which is used to calculate the peace dividend for the COMESA target called the COMESA Peace and Prosperity Index (CPPI). This framework uses a broad concept of conflict from latent conflict with positional differences to lethal and destructive armed conflict. A low-level, positional difference conflict may be characterized as a situation of peace. COMWARN makes use of the customised four levels of conflict from this data source. These are:

1. Latent conflict,
2. Manifest conflict,
3. Crisis, and
4. Severe crisis and war.

COMWARN and AU Continental Early Warning System (AU CEWS) - which uses a target of Conflict derived from the Conflict Barometer - realised that for purposes of early warning it was less helpful to include war as a separate level since it is the highest level of conflict that has to be prevented. By doing this, it was agreed that the fifth level according to the Conflict Barometer, that is, "war" would be collapsed and combined with the fourth level "severe crisis" to read "severe crisis and war".

Measurement or formulation

The values of the Conflict Barometer which are represented in a scale of 1-4 for each year in the selected historical profile are adjusted or compared using the values from the political Instability Task Force (PITF) as part of validation in case there could be an underestimation or overestimation of the level of conflict in a particular year. After the adjustment of the Conflict Barometer scale, COMWARN inverts the adjusted Conflict Barometer scale to come up with a peace dividend, which is one of the four components of the COMESA Peace and Prosperity Index (CPPI).

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Relevance to peace and prosperity and linkages with other SVA Indicators

Peace is essential for development in the COMESA region. It is an indisputable fact that there cannot be development without peace and vice versa. Article 3(d) of the COMESA Treaty underscores the need for Member States to cooperate in the promotion of peace, security and stability to enhance regional development. With that underpinning it cannot, therefore, be overemphasised that peace is critical for development.

Limitations of the data/ data source

It is widely accepted that the absence of war does not denote peace. To resolve this, apart from the indicator of Peace, there is an array of explanatory indicators that are used in the COMWARN SVA model to assist in explaining peace and prosperity within the region. The explanatory indicators are categorised into eight thematic baskets.

Mo Ibrahim Foundation

Indicator Details		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
a. Rule of law	a. IIAG Rule of law	Social Economic Governance Security Environment Health Education
b. Transparency and accountability	b. IIAG Transparency and accountability	
c. Peace and Safety	c. IIAG Peace and Safety	
d. National Security	d. IIAG National Security	
e. Participation	e. IIAG Participation	
f. Rights	f. IIAG Rights	
g. Gender	g. IIAG Gender	
h. Public Management	h. IIAG Public Management	
i. Business Environment	i. IIAG Business Environment	
j. Infrastructure	j. IIAG Infrastructure	
k. Rural Sector	k. IIAG Rural Sector	
l. Welfare	l. IIAG Welfare	
m. Education	m. IIAG Education	
n. Health	n. IIAG Health	

Brief Description of the Data Source

The Ibrahim Index of African Governance (IIAG) measures the quality of governance in all African countries on an annual basis. Conceptually driven by the Mo Ibrahim Foundation (MIF) Board and the IIAG Advisory Council the IIAG is refined on an annual basis since its launch in 2007 and has evolved to be the most comprehensive assessment tool on African governance. To achieve this, MIF compiles data from diverse sources to build an accurate and detailed picture of governance performance in every African country. The index is meant to: -

- Support citizens, governments, institutions and the private sector to accurately assess the delivery of public goods and services, and policy outcomes;
- Encourage data-driven narratives on governance issues;
- Help determine, debate and strengthen government performance.

For its work the Mo Ibrahim Foundation (MIF) defines governance as the provision of the political, social and economic goods and services that every citizen has the right to expect from their state, and that a state has the responsibility to deliver to its citizens.

Measurement or formulation

The overall Governance score is formulated by calculating an unweighted average of its underlying four categories. The indicators used in COMWARN are components of four main pillars of governance used in the Mo Ibrahim methodology that include:

- (i) Safety and Rule of Law;
- (ii) Participation and Human Rights;
- (iii) Sustainable Economic Opportunity; and
- (iv) Human Development.

Whilst the categories cited above are constructed by calculating an unweighted average of their respective sub-categories, the sub-category scores (COMWARN indicators) are aggregated from scores (with a scale of 0 – 100) of all their underlying indicators, which include 177 variables. The 14 indicators from Mo Ibrahim that are used in COMWARN SVAs and their underlying indicators are shown in the table below:

Constituent Indicators of the IIAG Category of indicators.

COMWARN derives fourteen indicators from the Mo Ibrahim database, the indicator values are obtained by aggregating the scores of all their underlying indicators as follows:

	Indicator Name	Underlying indicators
1	Rule of Law	Independence of the Judiciary, Independence and Transparency of the Judicial Process, Access to Justice, Property Rights, Mechanisms for Orderly Transfer of Power, Absence of Multilateral Sanctions
2	Transparency and Accountability	Access to Public and Legislative Information, Access to Records of State-Owned Companies, Accountability of Government and Public Employees, Sanctions for Abuse of Office, Absence of Corruption in Government Branches, Absence of Corruption in Public Sector, Absence of Corruption in Private Sector, Absence of Favouritism, Anti-Corruption Mechanisms
3	Peace and Safety	Perception of Personal Safety, Reliability of Police Services, Absence of Social Unrest, Absence of Crime, Absence of Government Violence against Civilians, Absence of Human Trafficking,
4	National Security	Absence of Government Involvement in Armed Conflict, Absence of Domestic Armed Conflict or Risk of Conflict, Absence of Violence against Civilians by Non-state Actors, Absence of Cross-border Tensions, Absence of Internally Displaced Persons, Absence of Refugees
5	Participation	Political Participation, Civil Society Participation, Democratic Elections, Capacity of Election Monitoring Agencies, Effective Power to Govern,
6	Rights	Freedom of Expression, Freedom of Association and Assembly, Civil Rights & Liberties, Ratification and Reporting of International Human Rights Conventions, Un-likelihood of Human Rights Abuses by the Government, Protection against Ethnic and Religious Discrimination,
7	Gender	Promotion of Gender Equality, Women's Political Participation, Gender Parity in Primary & Lower Secondary School, Women's Labour Force Participation, Workplace Gender Equality, Representation of Women in the Judiciary, Laws on Violence against Women, Women's Political Empowerment,
8	Public Management	Governmental Statistical Capacity, Civil Registration, Effectiveness of the Public Service, Online Public Services, Diversification of Exports, Budgetary and Financial Management, Budget Balance, Fiscal Policy, Tax and Revenue Mobilisation

9	Business Environment	Business Regulatory Environment, Absence of Excessive Bureaucracy and Red Tape, Absence of Restrictions on Foreign Investment, Efficiency of Customs Procedures, Robustness of Banks, Satisfaction with Employment Creation, Government Development of Regional Integration
10	Infrastructure	Enabling Environment for Infrastructure Development, Transport Infrastructure, Reliability of Electricity Supply, Digital and IT Infrastructure, Access to Drinking Water, Satisfaction with Provision of Water and Sanitation Service
11	Rural Sector	Access to Rural Land and Water for Agriculture, Rural Business Climate, Government Investment in Rural Development, Access to Agricultural Research and Extension Services, Budgetary Balance of Agricultural Policy, Participation of Rural Organisations, Promotion of Gender Parity in Rural Organisations, Rural Accountability and Transparency,
12	Welfare	Welfare Policies and Services, Promotion of Socio-economic Integration of Youth, Social Safety Nets, Social Protection and Labour Policies, Social Inclusion, Absence of Lived Poverty, Poverty Reduction Efforts, Satisfaction with Narrowing Income Gaps, Environmental Policies, Promotion of Environmental Sustainability
13	Education	Satisfaction with Education Provision, Education Quality, Alignment of Education with Market Needs, Human Resources in Primary Schools, Primary School Completion, Secondary Education Enrolment, Tertiary Education Enrolment
14	Health	Satisfaction with Basic Health Services, Public Health Campaigns, Absence of Child Mortality, Absence of Maternal Mortality, Access to Sanitation, Absence of Undernourishment, Absence of Communicable Diseases, Immunisation, Antiretroviral Treatment (ART) Provision,

Relevance of indicators to peace and prosperity

The indicators that COMWARN uses from the Mo Ibrahim Indicators of African Governance (IIAG) cover six baskets that are used in COMWARN SVAs. These are economy, education, governance, health, social and security. Their relevance to peace and security is as follows:

- Economy Basket indicators:** The indicators covered under this basket include infrastructure, rural sector and business environment. A properly regulated business environment that ensures efficiency and does not have many restrictions on foreign investment will enhance prosperity in a country. In addition, the availability of an enabling environment for business in terms of infrastructure, including transport, information technology, electricity and sanitation services

will create a conducive environment for business. As revealed by these indicators, there is also a need for government to develop rural areas to support agricultural production and business.

- **Education Basket indicators:** The education indicators covered under this basket focus on enrolments, availability of adequate resources (both material and human) in schools, quality, alignment of education curriculums with market needs and completion at each level. These factors are important in creating quality human capital that meets industrial needs and, therefore, can be easily absorbed by industry. The high quality of education can be related to high productivity, all other factors constant.
- **Governance Basket indicators:** The indicators covered under this basket include rule of law, transparency and accountability, peace and safety, national security, participation, rights, gender and public management. All these indicators that compile data related to access to justice and state resources, separation of powers, management of public institutions, respect of the rule of law and rights, transparency, accountability, absence of corrupt practices, freedom of expression, participation by women, inclusion, resort to peaceful means by government, among others, are important tenets for peace and prosperity.
- **Health Basket indicators:** The health indicator covered under this basket assesses the quality of health services provision and management of epidemics, reduction of child mortality and immunisation. A healthy population is important for productivity. By maintaining a healthy population, governments will also not face the burden of costs related to managing epidemics as opposed to preventing them.
- **Social Basket indicators:** The welfare indicator covered under this basket captures issues to do with the inclusion of the youth, welfare policies, poverty reduction efforts and environmental policies. With the youth dividend that Africa is forecasted to enjoy, to enhance peace and prosperity it becomes imperative to come up with policies that will ensure youth participation in key areas.



- **Security Basket indicators:** The national security indicator covered under this basket compiles data on government capability to maintain a secure environment, exercise restraint when addressing grievances from citizens and ensure that no one is forcibly displaced, provide a conducive environment for economic activities. All these attributes are necessary for peaceful prosperity.

32 | Limitations of the data/ data source

No significant limitations of the indicators identified

Transparency International

Indicator Details		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
Corruption Perception Index	Corruption Perception	Governance

Brief Description of the Data Source

The Corruption Perception Index (CPI) aggregates data from a number of different sources that provide perceptions by business people and country experts on the level of corruption in the public sector.

CPI source data captures the following aspects of corruption, based on the specific question wording used to collect the data:

- Bribery
- Diversion of public funds
- Prevalence of officials using public office for private gain without facing consequences
- Ability of governments to contain corruption and enforce effective integrity mechanisms in the

public sector

- Red tape and excessive bureaucratic burden which may increase opportunities for corruption
- Meritocratic versus nepotistic appointments in the civil service
- Effective criminal prosecution for corrupt officials
- Adequate laws on financial disclosure and conflict of interest prevention for public officials
- Legal protection for whistle-blowers, journalists, investigators when they are reporting cases of bribery and corruption
- State capture by narrow vested interests
- Access of civil society to information on public affairs

Measurement or formulation

The index, which ranks 180 countries and territories by their perceived levels of public sector corruption according to experts and business people uses a scale of 0 to 100, where 0 is highly corrupt and 100 is the least corrupt. In the COMWARN SVA model, this scale is inverted to ensure a high score reflects highly corrupt while a low score depicts low levels of corruption. Before 2012, the scale was from 0 to 10 with 0 being the least corrupt and 10 being the most corrupt. For its use, COMWARN converts all data before 2012 to the 0-100 scale.

Relevance to peace and prosperity and linkages with other SVA Indicators

There is a theoretical linkage between the indicators captured by this index and peace and prosperity. The continued reluctance by most government systems to address corrupt practices has significant ramifications on a country's peace and prosperity as it increases the cost of public services as well as the cost of doing business. In addition, it affects investor confidence, diverts resources allocated for the implementation of

specific important programmes and projects which will eventually cause discontent and disadvantage the public.

Limitation of the data/ data source

This index is however limited in the essence that it does not capture other manifestation of corruption for example, it does not capture:

- Citizen perceptions or experience of corruption
- Tax fraud
- Illicit financial flows
- Enablers of corruption (lawyers, accountants, financial advisors etc.)
- Money-laundering
- Private sector corruption
- Informal economies and markets

Varieties of Democracy (V-Dem)

Indicator Details		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
Electoral Democracy	VDEM Electoral Democracy	Governance
Liberal Democracy	VDEM Liberal Democracy	
Participatory Democracy	VDEM Participatory Democracy	
Deliberative Democracy	VDEM Deliberative Democracy	
Egalitarian Democracy	VDEM Egalitarian Democracy	

Brief Description of the Data Source

The Varieties of Democracy (V-Dem) is an international research project which manages a database of indicators of democracy in all countries all over the world. The project is led by the V-Dem Institute at the Department of Political Science at the University of Gothenburg located in Sweden. Varieties of Democracy (V-Dem) produces the largest global dataset on democracy with some 27 million data points for 202 countries from 1789. Involving over 3,000 scholars and other country experts, V-Dem measures hundreds of different attributes of democracy. V-Dem enables new ways to study the nature, causes, and consequences of democracy embracing its multiple meanings. The dataset aims to understand to what extent the ideals of electoral democracy, liberal democracy, participatory democracy, deliberative democracy and egalitarian democracy are achieved. To do this, these categories are treated as indices with sub-indices that feed into them. To make Liberal, Participatory, Deliberative and Egalitarian indices measures of not only their principles, but also of democracy, the indices take the level of electoral democracy into account.

For COMWARN's use, the electoral principle of democracy seeks to embody the core value of making governments responsive to their citizens, achieved through electoral competition for the electorate's approval under circumstances when suffrage is extensive; political and civil society organisations can operate freely; elections are transparent and not marred by fraud or systematic irregularities; and elections affect the composition of the chief executive of the country. In between elections, there is freedom of expression and an independent media capable of presenting alternative views on matters of political relevance. In the V-Dem conceptual scheme, electoral democracy is understood as an essential element of any other conception of representative democracy – liberal, participatory, deliberative, egalitarian, or some other.

The liberal principle of democracy emphasizes the importance of protecting individual and minority rights against the dominance of the state and the dominance of the majority. The liberal model takes a "negative" view of political power insofar as it judges the quality of democracy by the limits placed on government. This is achieved by constitutionally protected civil liberties, strong rule of law, an independent judiciary, and effective checks and balances that, together, limit the exercise of executive power.

Whilst the participatory principle of democracy emphasizes active participation by citizens in all political processes, electoral and non-electoral, the deliberative principle of democracy focuses on the process by

which decisions are reached in a polity. A deliberative process is one in which public reasoning focused on the common good motivates subjective decisions—as contrasted with emotional appeals, solidary attachments, parochial interests, or coercion. According to this principle, democracy requires more than an aggregation of existing preferences and further advocates that there should also be respectful dialogue at all levels—from preference formation to final decision—among informed and competent participants who are open to persuasion.

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The fifth principle covered under this dataset, the egalitarian principle of democracy, holds that material and immaterial inequalities inhibit the exercise of formal rights and liberties, and diminish the ability of citizens from all social groups to participate. Egalitarian democracy is achieved when:

- a) rights and freedoms of individuals are protected equally across all social groups;
- b) Resources are distributed equally across all social groups; and
- c) Groups and individuals enjoy equal access to power.

Measurement or formulation

- a. Electoral democracy index (D) (v2x polyarchy): This index is formed by taking the average of, on the one hand, the weighted average of the indices measuring freedom of association (v2x frassoc thick), clean elections (v2xel - frefair), freedom of expression (v2x freexp altinf), elected officials (v2x elecoeff), and suffrage (v2x suffr) and, on the other, the five-way multiplicative interaction between those indices. This is half way between a straight average and strict multiplication, meaning the average of the two. The aggregation is done at the level of Dahl's sub-components with the one exception of the non-electoral component. The scale used is from 0-1 where 0 represents low and 1 represents high.
- b. Liberal democracy index (D) (v2x libdem): This index is aggregated using this formula:

$$v2x_libdem = .25 * v2x_polyarchy1.585 + .25 * v2x_liberal + .5 * v2x_polyarchy1.585 * v2x_liberal$$

To obtain the value of the liberal democracy index ($v2x\ libdem$), using the formula above V-DEM combines values of the:

- i. normalised electoral democracy index ($.25 * v2x_polyarchy^{1.585}$);
 - ii. normalised liberal component index ($.25 * v2x_liberal$); and
 - iii. liberal component index ($* v2x_liberal$) normalised by a component of electoral democracy ($.5 * v2x_polyarchy^{1.585}$).
- c. Participatory democracy index (D) ($v2x\ partipdem$): The index is aggregated using this formula:

$$v2x\ partipdem = .25 * v2x\ polyarchy^{1.585} + .25 * v2x\ partip + .5 * v2x\ polyarchy^{1.585} * v2x\ partip$$

To obtain the value of the liberal democracy index ($v2x\ partipdem$), using the formula above V-DEM combines values of the:

- i. normalised electoral democracy index ($.25 * v2x\ polyarchy^{1.585}$);
 - ii. normalised participatory component index ($.5 * v2x\ polyarchy^{1.585}$); and
 - iii. participatory component index ($v2x\ partip$) normalised by a component of the electoral democracy index ($.5 * v2x\ polyarchy^{1.585}$).
- d. Deliberative democracy index (D) ($v2x\ delibdem$): The index is aggregated using this formula:

$$v2x\ delibdem = .25 * v2x\ polyarchy^{1.585} + .25 * v2x\ delib + .5 * v2x\ polyarchy^{1.585} * v2x\ delib$$

This formula for calculating the deliberative democracy index ($v2x\ delibdem$) aggregates values of the:

- i. normalised electoral democracy index ($.25 * v2x\ polyarchy^{1.585}$);
- ii. normalised deliberative component index ($.25 * v2x\ delib$); and



iii. deliberative component index (v2x delib) normalised by a component of electoral democracy index (.5 * v2x polyarchy^{1.585}).

e. Egalitarian democracy index (D) (v2x egalDEM): The index is aggregated using this formula:

$$v2x\ egalDEM = .25 * v2x\ polyarchy^{1.585} + .25 * v2x\ egal + .5 * v2x\ polyarchy^{1.585} * v2x\ egal$$

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In the V-DEM dataset, the egalitarian democracy index is an aggregation of the:

- i. normalised electoral democracy index (.25 * v2x polyarchy^{1.585});
- ii. normalised egalitarian component index (.25 * v2x egal); and
- iii. egalitarian component index (v2x egal) normalised by a component of electoral democracy index (.5 * v2x polyarchy^{1.585}).

Relevance to Peace and Prosperity and linkages with other SVA indicators

Democratic principles and values are important for democratic development. Taking into account the general principles of democracy that include transparency, accountability, responsiveness, respect of the rule of law, popular participation, respect of human rights, among others, it is notable that these are the imperatives that have been incorporated into the various laws, rules and regulations to ensure adherence to these good standards that are crucial for peace and prosperity.

Article 6 (e,f,g,h) of the COMESA Treaty articulates some Fundamental Principles that are crucial for peace and prosperity and democratic consolidation in the region. These include the following:

- (Article 6e) Recognition, promotion and protection of human and people's rights in accordance with the provisions of the African Charter on Human and People's Rights;
- (Article 6f) Accountability, economic justice and popular participation in development;
- (Article 6g) The recognition and observance of the rule of law; and

- (Article 6h) The promotion and sustenance of a democratic system of governance in each Member State.

Limitations of the data/ data source

The indices are a compromise between the two most well-known aggregation formulas in the literature, both allowing partial “compensation” in one sub-component for lack of polyarchy in the others, but also punishing countries not strong in one sub-component according to the “weakest link” argument.

Virtual Research Associates

Indicator Details		
Source Indicator name	COMWARN Indicator name	COMWARN Baskets
Global Press Attention-Conflict (Average International Conflict)	International Conflict	Governance and Security
Global Press Attention – Cooperation Conflict (Average International Cooperation)	International Cooperation	

Brief Description of the Data Source

Virtual Research Associates (VRA) located in Boston, USA was established in 1996 as a Massachusetts corporation to support the development of data required to analyse news and other reports on volatile conflict situations globally. For its work, the Virtual Research Associates collects data for these indicators from International Media sources and through use of machine-coded algorithms classifies this data using the Goldstein scale.

Measurement or formulation

The data for the two indicators represents the average of international conflict and the average international cooperation scores based on the average of summed international values for each of the indicator. In both cases, the numerator in this equation is the summed total of Goldstein International Conflict and Cooperation



values, and the denominator is the summed total of Goldstein International Conflict and Cooperation values, respectively. The mean is calculated as the absolute value of the summed total of Goldstein International values based on each of the indicators. The data are machine-coded from Agence France-Presse (AFP) and Reuters global news feeds aggregated annually by country.

Relevance to Peace and Prosperity and linkages with other SVA indicators

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The way a country's peace and security situation is viewed based on international media reports will to some extent have an influence on cooperation on areas of common interest. Certain behaviours can encourage peace whilst other behaviours might aggravate conflict. In that regard, certain behaviour will also determine how other countries will respond and also treat a country behaving in a certain way.

Limitation of the data/ data source

These indicators rely solely on media which sometimes might report inaccurate or biased information. To circumvent this, other global indicators that obtain data using different methods have been incorporated into the COMWARN SVA model.

World Bank

Indicator Details		
Source Indicator name	COMWARN Indicator name	COMWARN Basket
67 indicators are covered separately		All eight baskets

Brief Description of the Data Source

The World Bank Group is a multi-lateral lending institution established in 1944 to assist in rebuilding Europe from the devastations of the Second World War (1939 – 1945). It became popular then as the International Bank for Reconstruction and Development (IBRD) and after the war continued to function as an international organisation providing financial assistance (grants and loans) mostly to developing nations. To date, the World Bank Group, that comprises IBRD and IDA has grown to 189 member countries. As part of its work, the World Bank compiles over 1,500 indicators annually using data from its various divisions, Bretton Woods affiliates

(WTO and IMF) and other international organisations such as OECD, SIPRI and UN agencies such as FAO, WHO, UNAIDS, UNESCO, UNHCR, UNDP and UNICEF.

As of 2018 the COMWARN SVA methodology began using a total of 144 indicators. Out of these, 67 were from the World Bank. To aggregate its indicators, the WB uses a variety of statistical methods and normalisation techniques that include weighted averages, sums, medians, percentages, ratios, base periods, base currencies or a combination of two or more methods. Indicators are disaggregated by gender, geography and age cohorts. It is important to note that the indicators from the World Bank fall into all the eight (8) thematic baskets that COMWARN uses to classify its SVA indicators. In addition, three (3) of the four (4) CPPI components are derived from the WB. These are health, wealth and trade openness.

The table below shows the list of COMWARN indicators derived from the World Bank. Health, wealth and trade openness indicators have been shown in italics just to indicate that they are part of the target variable (CPPI).

List of COMWARN indicators drawn from the World Bank

COMWARN Name	World Bank Name
Economy Basket	
Agricultural Land	Agricultural land (% of land area)
Production, Food	Food production index (2004-2006 = 100)
Production, Livestock	Livestock production index (2004-2006 = 100)
Value Addition to Agriculture	Agriculture, value added (% of GDP)
Natural Resources Rents	Total natural resources rents (% of GDP)
Capital Formation	Gross capital formation (% of GDP)
Energy Efficiency	GDP per unit of energy use (PPP \$ per kg of oil equivalent)
<i>Trade Openness</i>	Trade (% of GDP)
Foreign Direct Investment	Foreign direct investment, net inflows (% of GDP)



Female Youth Employment	Employment to population ratio, ages 15-24, female (%) (modelled ILO estimate)
Male Youth Employment	Employment to population ratio, ages 15-24, male (%) (modelled ILO estimate)
Female Employment, 15+	Employment to population ratio, 15+, female (%) (modelled ILO estimate)
Employed Females	Labour force, female (% of total labour force)
Economic Growth	GNI growth (annual %)
<i>Wealth</i>	GDP per capita, PPP (constant 2011 international \$)
Foreign Aid Received	Net official development assistance and official aid received (constant 2013 US\$)
Foreign Debt Obligations	External debt stocks (% of GNI)
Foreign Debt Payments	Interest payments on external debt (% of GNI)
Inflation, CPI	Inflation, consumer prices (annual %)
Government Expenditures	General Government final consumption expenditure (% of GDP)
Health Expenditures, Public	Current health expenditure (% of GDP)
Health Expenditures, Government	Domestic general government health expenditure (% of general government expenditure)
Health Expenditures, Total	Domestic general government health expenditure per capita (current US\$)
Military Expenditures	Military expenditure (% of GDP)
Elderly Age Dependency	Age dependency ratio, old (% of working-age population)
Youth Age Dependency	Age dependency ratio, young (% of working-age population)

COMWARN Name	World Bank Name
Education Basket	
School Enrolment, Pre-Primary, Female	School enrolment, pre-primary, female (% gross)
School Enrolment, Pre-Primary, Male	School enrolment, pre-primary, male (% gross)
School Enrolment, Primary, Female	School enrolment, primary, female (% gross)
School Enrolment, Primary, Male	School enrolment, primary, male (% gross)
Gender Parity in Primary School Enrolment	School enrolment, primary (gross), gender parity index (GPI)
Pupil-Teacher Ratio in at Primary Level	Pupil-teacher ratio, primary
School Enrolment, Secondary, Female	School enrolment, secondary, female (% gross)
School Enrolment, Secondary, Male	School enrolment, secondary, male (% gross)
School Enrolment, Tertiary, Female	School enrolment, tertiary, female (% gross)
School Enrolment, Tertiary, Male	School enrolment, tertiary, male (% gross)
Environment Basket	
Carbon Dioxide Emissions	CO2 emissions (kt)
Protected Land	Terrestrial protected areas (% of total land area)
Protected Waters	Marine protected areas (% of territorial waters)
Agricultural Land	Agricultural land (% of land area)
Energy Efficiency	GDP per unit of energy use (PPP \$ per kg of oil equivalent)
Rural Standard of Living, Sanitation	People using at least basic sanitation services, rural (% of rural population)
Urban Standard of Living, Sanitation	People using at least basic sanitation services, urban (% of urban population)

COMWARN Name	World Bank Name
Governance Basket	
Women Parliamentarians	Proportion of seats held by women in national parliaments (%)
Government Expenditures	General Government final consumption expenditure (% of GDP)
Health Expenditures, Government	Domestic general government health expenditure (% of general government expenditure)
Health Expenditures, Public	Current health expenditure (% of GDP)
Foreign Aid Received	Net official development assistance and official aid received (constant 2013 US\$)
Standard of Living, Water	People using at least basic drinking water services (% of population)
Refugees by Asylum	Refugee population by country or territory of asylum
Refugees by Origin	Refugee population by country or territory of origin
Health Basket	
Rural Standard of Living, Sanitation	People using at least basic sanitation services, rural (% of rural population)
Urban Standard of Living, Sanitation	People using at least basic sanitation services, urban (% of urban population)
Standard of Living, Water	People using at least basic drinking water services (% of population)
Prevalence of HIV in Population	Prevalence of HIV, total (% of population ages 15-49)
Prevalence of HIV in Female Youths	Prevalence of HIV, female (% ages 15-24)
Prevalence of HIV in Male Youths	Prevalence of HIV, male (% ages 15-24)
Women Living With HIV, 15+	Women's share of population ages 15+ living with HIV (%)
Infectious diseases	Incidence of tuberculosis (per 100,000 people)
<i>Health</i>	<i>Inverse of</i> - Mortality rate, under-5 (per 1,000 live births)
Anaemia among Children	Prevalence of anaemia among children (% of children under 5)

Prevention of DPT	Immunization, DPT (% of children ages 12-23 months)
Prevention of Measles	Immunization, measles (% of children ages 12-23 months)
Female Mortality	Mortality rate, adult, female (per 1,000 female adults)
Male Mortality	Mortality rate, adult, male (per 1,000 male adults)
Birth Rate	Birth rate, crude (per 1,000 people)
Life Expectancy at Birth, Female	Life expectancy at birth, female (years)
Life Expectancy at Birth, Male	Life expectancy at birth, male (years)
Survival to Age 65, Female	Survival to age 65, female (% of cohort)
Survival to Age 65, Male	Survival to age 65, male (% of cohort)
Health Expenditures, Public	Current health expenditure (% of GDP)
Health Expenditures, Government	Domestic general government health expenditure (% of general government expenditure)
Health Expenditures, Total	Domestic general government health expenditure per capita (current US\$)
Military Basket	
Military Expenditures	Military expenditure (% of GDP)
Military Personnel	Armed forces personnel (% of total labour force)
Battle Deaths	Battle-related deaths (number of people)
Security Basket	
Battle Deaths	Battle-related deaths (number of people)

COMWARN Name	World Bank Name
Social Basket	
Population	Population, total
Population, Urban	Urban population (% of total)
Population Density	Population density (people per sq. km of land area)
Population, Female	Population, female
Elderly Age Dependency	Age dependency ratio, old (% of working-age population)
Youth Age Dependency	Age dependency ratio, young (% of working-age population)
Women Parliamentarians	Proportion of seats held by women in national parliaments (%)
Refugees by Asylum	Refugee population by country or territory of asylum
Refugees by Origin	Refugee population by country or territory of origin
Birth Rate	Birth rate, crude (per 1,000 people)

Linkage of Baskets to peace and Prosperity

- a. Economy Basket indicators and relevance to Peace and Prosperity: To enhance peace and prosperity, every country requires a vibrant economy that provides opportunities for livelihoods and growth. In the COMESA region, agriculture, mining, manufacturing and services such as tourism and Information and Communications Technology (ICT), account for a sizeable share of the GDP. The COMWARN SVA indicators which are derived from the World Bank and are classified into the economy basket include Food Production, Livestock Production, Value Addition to Agriculture that contribute directly to food security and national revenue. In addition, Inflation, Trade Openness, Economic Growth, Wealth, Capital Formation, Foreign Debt Obligations and Foreign Debt Payments which are used to assess the macro environment, including creditworthiness may influence investor perceptions.

Additional indicators in this basket include Foreign Direct Investments (FDI), foreign aid received and natural resource rents which account for the bulk of development finance. The economy basket also includes indicators that capture dependency ratios (young and aged) as well as employment rates disaggregated by age and gender. Indicators in this basket such as energy efficiency and Government expenditures in essential sectors like health and military will be discussed in more detail under the environment, health and military baskets, respectively. The indicators in the economy basket are also important in promoting an environment compatible with Sustainable Development Goals 8, 9 and 11 aimed at promoting inclusive and sustainable economic growth, full and productive employment and decent work for all.

- b. Education Basket indicators and relevance to Peace and Prosperity: The education basket in COMWARN SVAs consists mainly of indicators that contain data on gross enrolment ratios at pre-primary, primary, secondary and tertiary levels. The indicators are disaggregated by gender. Additional indicators in this basket include the teacher-pupil ratio at primary level and gender parity in primary education. Whilst primary education provides children with basic reading, writing, and mathematics skills along with an elementary understanding of such subjects as history, geography, natural science, social science, art, and music, respectively, secondary education completes the provision of basic education that began at the primary level and aims at laying the foundations for lifelong learning and human development, by offering more subject or skills-oriented instruction using more specialised teachers.

On the other hand, tertiary education, as a minimum condition of admission, requires the successful completion of education at the secondary level. The Gender Parity Index (GPI) indicates parity between girls and boys. A GPI of less than 1 suggests girls are more disadvantaged than boys in learning opportunities and a GPI of greater than 1 suggests the other way around. Eliminating gender disparities in education would help increase the status and capabilities of females. The pupil-teacher ratio is often used to compare the quality of schooling across countries, but it is often weakly related to student learning and quality of education. There is evidence that developments in human capital, including through education provides access to more opportunities for employment and economic development.

- c. Environment Basket indicators and relevance to Peace and Prosperity: The discussions in this

48 | basket are focused on indicators such as energy efficiency, carbon dioxide emissions, protected land and protected waters. More efficient use of energy for commercial purposes naturally accounts for increased GDP. However, carbon dioxide emissions into the atmosphere have increased the rate of global warming and contributed to anthropogenic climate change and oceanic acidification. Climate change effects are a threat to Africa's peace and security. In line with this, the Peace and Security Council of the African Union (AU) dedicated its 774th meeting on 21st May 2018, to an open session on the theme: "The link Between Climate Change and Conflicts in Africa and Addressing the Security Implications".

In addition, as threats to biodiversity such as deforestation mount, the international community is increasingly focusing on conserving diversity through strategies like habitat conservation which are vital for stemming this loss. COMESA Member States can also look at ways in which the proportion of terrestrial and marine areas protected can be increased to help defend vulnerable plant and animal species and safeguard biodiversity.

- d. Governance Basket indicators and relevance to Peace and Prosperity: The indicators in this basket mainly reflect the way a Government conducts its affairs and addresses the needs of its populace. It should be noted that governance has a bearing on all facets of life. Some of the indicators covered in this basket such as Women Parliamentarians are intended to record the number of legislative seats occupied by females representing various constituencies, an attribute of inclusivity that is critical for democratic development. In addition, women's participation determines the extent to which they can influence laws and policies.³
- e. Health Basket indicators and relevance to Peace and Prosperity: The indicators in this basket generally contain data that can be used to assess the health status of any given country. The general assumption is that a healthy population is more productive and also reduces the heavy burden on Government to deal with communicable diseases and provision of health services. Global access to safe water and proper hygiene education can reduce illnesses and deaths from communicable diseases such as cholera, typhoid, dysentery, dracunculiasis (Guinea worm disease) and diarrhoea which put a strain on health services. Often, children are the most vulnerable, therefore, improving access to clean drinking water and proper sanitation facilities

is a crucial element in the reduction of under-five mortality and morbidity and there is evidence that ensuring higher levels of drinking water services has a greater impact.

The extent of Government spending in health is also associated with the level of health system in any country and Sustainable Development Goal 3 stipulates the need to strengthening health financing to attain universal health coverage (UHC). With the prevalence of HIV, Governments are obliged to secure treatment to ease the burden of HIV. Of concern in the COMESA region is that most new infections have been occurring in young adults, with young women especially vulnerable which will have an impact on future generations. Closely associated with this are opportunistic infections such as, Tuberculosis (measured by Incidence of Tuberculosis) which was identified by the UN in 1996 as one of the three global main causes of adult deaths from a single infectious agent. All these diseases contribute to survival, mortality rates and life expectancy.

- f. Military Basket indicators and relevance to Peace and Prosperity: Military Personnel and Military Expenditures indicators will be discussed in this basket since Battle Deaths is explained under the Security Basket. Globally, the importance of the military in any sovereign state's peace, security and stability cannot be overemphasised. Article 3(d) of the COMESA Treaty emphasises the need to cooperate in the promotion of peace, security and stability among the COMESA Member States. In essence, without security and stability, there cannot be peace and development. Notwithstanding, there are many factors that influence the size and type of military including perceptions of vulnerability and risk, historical and cultural traditions, the length of borders that need to be secured, the quality of relations with neighbours, and the role of the armed forces in the body politic. As an "input" measure, military expenditures are not directly related to the "output" of military activities, capabilities, or security. Although national defence is an important function of government, high military expenditures for defence can burden the economy and impede growth.
- g. Security Basket indicators and relevance to Peace and Prosperity: This basket consists of the Battle Deaths indicator. This indicator records all military and civilian deaths in battle-related

conflicts between warring parties, usually involving armed forces. This includes traditional battlefield fighting, guerrilla activities, and all kinds of bombardments of military units, cities, and villages. Armed conflict is often associated with the destruction of infrastructure, forced migration, transnational crimes, disruption of services and economic activities.

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- h. Social Basket indicators and relevance to Peace and Prosperity: This basket consists of indicators that relatively exert demographic pressures. These indicators include Population, Urban Population, Population Density, Female Population, Age Dependency (both for Elderly and Youth), Refugees by Asylum, Refugees by Origin and Birth Rate. The indicator of Women Parliamentarians that seeks to record societal representation at national level is well-captured in the discussions under the governance basket. Despite exerting demographic pressures, these indicators also have several advantages. For instance, Africa is predicted to have more working-age adults per child by 2030. This implies that the continent has an opportunity to harness economic benefits from this demographic dividend. (Ashford, 2007). In addition, movement of people, most often through migration, is a significant part of global integration. Migrants contribute to the economies of both their host country and their country of origin.

Limitation of the data/ data source

There are no significant limitations identified on indicators derived from the World Bank. This is because COMWARN selects only indicators with sufficient data to be used in the SVA model

World Economic Forum

Indicator Details		
Source Indicator name from the two indices	COMWARN Indicator name	COMWARN Basket
<ul style="list-style-type: none"> □ Global Competitive Index <ul style="list-style-type: none"> a. Business dynamism b. Financial system c. Product Market d. Health e. Skills f. Infrastructure g. Innovation capability h. Institutions i. Labour Market j. Macro-economic stability k. Market size l. ICT adoption □ Global Gender Index <ul style="list-style-type: none"> a. Economic Participation b. Educational attainment c. Health and Survival d. Political empowerment 	<ul style="list-style-type: none"> □ Global Competitive Index <ul style="list-style-type: none"> a. GCI Business sophistication b. GCI Financial Market Development c. GCI Goods Market Efficiency d. GCI Health and Primary Education e. GCI Higher Education and Training f. GCI Infrastructure g. GCI Innovation h. GCI Institutions i. GCI Labour Market Efficiency j. GCI Macro-economic environment k. GCI Market size l. GCI Technological Readiness □ Global Gender Index <ul style="list-style-type: none"> a. GGGI Economic Participation b. GGGI Educational attainment c. GGGI Health and Survival d. GGGI Political empowerment 	Economic Education Governance Health

Brief Description of the Data Source

The WEF has two broad indices, the Global Competitive Index and the Global Gender index.

- a. The GCI published annually by the World Economic Forum since 2004, integrates macro-economic and micro-business aspects of competitiveness into a single index. It is made up of 110 variables organised into twelve pillars, with each pillar representing an area considered as an important determinant of competitiveness. For its use, COMWARN uses the 12 sub-indices (pillars) of the Global Competitive Index (GCI) as indicators.

- b. The GGGI published annually by the World Economic Forum (WEF) since 2006, ranks countries according to the calculated gender gap between men and women. It is made up of 14 variables organised into four pillars, with each pillar representing an area considered as an important determinant of gender equality. For its use, COMWARN uses the 4 sub-indices (pillars) of the Global Gender Gap Index as indicators. The index measures women's disadvantage compared to men and is not a measure of the equality of the gender gap. Therefore, gender imbalances to the advantage of women do not affect the score.

Constituent Indicators of World Economic Forum category of indicators

	Indicator Name	Underlying indicators
Global Competitive Index		
1	GCI Business Sophistication	Business sophistication concerns two elements that are intricately linked. These are the quality of a country's overall business networks and the quality of individual firms' operations and strategies. The quality of a country's business networks and supporting industries, as measured by the quantity and quality of local suppliers and the extent of their interaction, is important for the creation of clusters that improve efficiency and promote innovation in processes and products whilst at the same time reducing barriers to entry for new firms.
2	GCI Financial Market Development	This indicator records data related to the level of efficiency and sophistication in various financial sectors. Attributes considered include a sound regulatory framework for the financial sector that ensures the trustworthiness, transparency and proper functioning of the banking sector, securities exchanges, venture capital, and other financial products.

	Indicator Name	Underlying indicators
3	GCI Goods Market Efficiency	Countries with efficient goods markets are well positioned to produce the right mix of products and services given their particular supply-and-demand conditions, as well as to ensure that these goods can be most effectively traded in the economy. Healthy market competition, both domestic and foreign, is important in driving market efficiency, and thus business productivity, by ensuring that the most efficient firms, producing goods demanded by the market, are those that thrive. Market efficiency also depends on demand conditions such as customer orientation and buyer sophistication. For cultural or historical reasons, customers may be more demanding in some countries than in others. This can create an important competitive advantage, as it forces companies to be more innovative and customer-oriented and thus imposes the discipline necessary for efficiency to be achieved in the market.
4	GCI Health and Primary Education	A healthy workforce is vital to a country's competitiveness and productivity. Workers who are ill cannot function to their potential and will be less productive. Poor health leads to significant costs to business, as sick workers are often absent or operate at lower levels of efficiency. Investment in the provision of health services is thus critical for clear economic, as well as moral, considerations. In addition to health, this pillar takes into account the quantity and quality of the basic education received by the population, which is fundamental in today's economy. Basic education increases the efficiency of each individual worker.
5	GCI Higher Education and Training	Quality higher education and training is crucial for economies that want to move up the value chain beyond simple production processes and products. In particular, today's globalizing economy requires countries to nurture pools of well-educated workers who are able to perform complex tasks and adapt rapidly to their changing environment and the evolving needs of the production system. This pillar measures secondary and tertiary enrollment rates as well as the quality of education as evaluated by business leaders. The extent of staff training is also taken into consideration because of the importance of vocational and continuous on-the-job training—which is neglected in many economies—for ensuring a constant upgrading of workers' skills.

	Indicator Name	Underlying indicators
6	GCI Infrastructure	Extensive and efficient infrastructure is critical for ensuring the effective functioning of the economy. Effective modes of transport—including high-quality roads, railroads, ports, and air transport—enable entrepreneurs to get their goods and services to market in a secure and timely manner and facilitate the movement of workers to the most suitable jobs. Economies also depend on electricity supplies that are free from interruptions and shortages so that businesses and factories can work unimpeded. Finally, a solid and extensive telecommunications network allows for a rapid and free flow of information, which increases overall economic efficiency by helping to ensure that businesses can communicate, and decisions are made by economic actors taking into account all available relevant information.
7	GCI Innovation	The last pillar focuses on innovation. Innovation is particularly important for economies as they approach the frontiers of knowledge, and the possibility of generating more value by merely integrating and adapting exogenous technologies tends to disappear. In these economies, firms must design and develop cutting-edge products and processes to maintain a competitive edge and move toward even higher value-added activities. This progression requires an environment that is conducive to innovative activity and supported by both the public and the private sectors. In particular, it means sufficient investment in research and development (R&D), especially by the private sector; the presence of high-quality scientific research institutions that can generate the basic knowledge needed to build the new technologies; extensive collaboration in research and technological developments between universities and industry; and the protection of intellectual property.

	Indicator Name	Underlying indicators
8	GCI Institutions	<p>The institutional environment of a country depends on the efficiency and the behaviour of both public and private stakeholders. The legal and administrative framework within which individuals, firms, and governments interact determines the quality of the public institutions of a country and has a strong bearing on competitiveness and growth. It influences investment decisions and the organisation of production and plays a key role in the ways in which societies distribute the benefits and bear the costs of development strategies and policies. Good private institutions are also important for the sound and sustainable development of an economy. The 2007–08 global financial crisis, along with numerous corporate scandals, has highlighted the relevance of accounting and reporting standards and transparency for preventing fraud and mismanagement, ensuring good governance, and maintaining investor and consumer confidence.</p>
9	GCI Labor Market Efficiency	<p>The efficiency and flexibility of the labor market are critical for ensuring that workers are allocated to their most effective use in the economy and provided with incentives to give their best effort in their jobs. Labor markets must therefore have the flexibility to shift workers from one economic activity to another rapidly and at low cost, and to allow for wage fluctuations without much social disruption. Efficient labor markets must also ensure clear strong incentives for employees and promote meritocracy at the workplace, and they must provide equity in the business environment between women and men. Taken together these factors have a positive effect on worker performance and the attractiveness of the country for talent, two aspects of the labor market that are growing more important as talent shortages loom on the horizon.</p>
10	GCI Macroeconomic Environment	<p>The stability of the macroeconomic environment is important for business and, therefore, is significant for the overall competitiveness of a country. Although it is certainly true that macroeconomic stability alone cannot increase the productivity of a nation, it is also recognized that macroeconomic disarray harms the economy. The government cannot provide services efficiently if it has to make high-interest payments on its past debts. Running fiscal deficits limits the government’s future ability to react to business cycles. Firms cannot operate efficiently when inflation rates are out of hand. In sum, the economy cannot grow in a sustainable manner unless the macro environment is stable.</p>

	Indicator Name	Underlying indicators
11	GCI Market Size	The size of the market affects productivity since large markets allow firms to exploit economies of scale. Traditionally, the markets available to firms have been constrained by national borders. In the era of globalisation, international markets have become a substitute for domestic markets, especially for small countries. Thus, exports can be thought of as a substitute for domestic demand in determining the size of the market for the firms of a country. By including both domestic and foreign markets in our measure of market size, we give credit to export-driven economies and geographic areas that are divided into many countries but have a single common market.
12	GCI Technological Readiness	The technological readiness pillar measures the agility with which an economy adopts existing technologies to enhance the productivity of its industries, with specific emphasis on its capacity to fully leverage information and communication technologies (ICTs) in daily activities and production processes for increased efficiency and enabling innovation for competitiveness. Whether the technology used has or has not been developed within national borders is irrelevant for its ability to enhance productivity. The central point is that the firms operating in the country need to have access to advanced products and blueprints and the ability to absorb and use them. Among the main sources of foreign technology, foreign direct investment (FDI) often plays a key role, especially for countries at a less advanced stage of technological development.
	Indicator Name	Underlying indicators
Global Gender Gap Index		
1	GGGI Economic Participation and Opportunity	This sub-index captures the participation gap using the difference between women and men in labour force participation rates. The remuneration gap is captured through a hard data indicator (ratio of estimated female-to-male earned income) and a qualitative indicator gathered through the World Economic Forum's annual Executive Opinion Survey (wage equality for similar work). Finally, the gap between the advancement of women and men is captured through two hard data statistics (the ratio of women to men among legislators, senior officials and managers, and the ratio of women to men among technical and professional workers).

2	GGGI Educational Attainment	This sub-index captures the gap between women’s and men’s current access to education through ratios of women to men in primary-, secondary- and tertiary-level education. A longer-term view of the country’s ability to educate women and men in equal numbers is captured through the ratio of the female literacy rate to the male literacy rate. Higher ratios indicate more gender equality. The construction of the GGGI involves conversion of all data to ratios, truncation of data at equality benchmarks, calculation of sub-index scores, and calculation of final scores.
3	GGGI Health and Survival	This sub-index provides an overview of the differences between women’s and men’s health through the use of two indicators. The first is the sex ratio at birth, which aims specifically to capture the phenomenon of “missing women”, prevalent in many countries with a strong son preference. ⁴ Second, we use the gap between women’s and men’s healthy life expectancy. This measure provides an estimate of the number of years that women and men can expect to live in good health by taking into account the years lost to violence, disease, malnutrition and other relevant factors. Higher ratios indicate more gender equality. The construction of the GGGI involves conversion of all data to ratios, truncation of data at equality benchmarks, calculation of sub-index scores, and calculation of final scores.
4	GGGI Political Empowerment	This sub-index measures the gap between men and women at the highest level of political decision-making through the ratio of women to men in ministerial positions and the ratio of women to men in parliamentary positions. In addition, we’ve included the ratio of women to men in terms of years in executive office (prime minister or president) for the last 50 years. A clear drawback in this category is the absence of any indicators capturing differences between the participation of women and men at local levels of government. Should such data become available at a globally comparative level in future years, it will be considered for inclusion in the Index. Higher ratios indicate more gender equality. The construction of the GGGI involves conversion of all data to ratios, truncation of data at equality benchmarks, calculation of sub-index scores, and calculation of final scores.



Measurement or formulation

- a. The GCI indicators: The GCI indicators use a score of 1 to 7, with one being the least score and 7 the highest score in terms of global competitiveness. The GCI indicators assign relative weights to pillars on efficiency, innovation and sophistication depending on a country's level of development. To implement this concept, the pillars are organized into three sub-indices, each critical to a particular stage of development. These are:
 - i. The basic requirements sub-index;
 - ii. The efficiency enhancers sub-index; and
 - iii. The innovation and sophistication factors sub-indices.

The basic requirements sub-index groups those pillars most critical for countries in the factor-driven stage. The efficiency enhancers sub-index includes those pillars critical for countries in the efficiency-driven stage. The innovation and sophistication factors sub-indices include the pillars critical to countries in the innovation-driven stage. However, note that from 2018 the scores differed from previous years due to a change in the methodology. The data from 2018 onwards cannot be used together with the prior data without a transformation.

- b. Global Gender Gap Index: It uses a ratio of 0 - 1 with 0 being the least score and 1 the highest score in terms of gender equality. The construction of the GGGI involves conversion of all data to ratios, truncation of data at equality benchmarks, calculation of sub-index scores, and calculation of final scores. The Global Gender Gap Index (GGGI) examines the gap between men and women across four fundamental categories (sub-indices): Economic Participation and Opportunity, Educational Attainment, Health and Survival and Political Empowerment. Some of the steps taken to ensure data accuracy include:
 - i. Conversion to ratios: Initially, all data is converted to female-to-male ratios. For example, a country with 20% of women in ministerial positions is assigned a ratio of 20 women to 80 men, thus a value of 0.25. This is to ensure that the Index is capturing gaps between women and men's attainment levels, rather than the levels themselves.

- ii. Data truncation at equality benchmark: As a second step, these ratios are truncated at the “equality benchmark”. For all indicators, except the two health indicators, this equality benchmark is considered to be 1, meaning equal numbers of women and men. In the case of sex ratio at birth, the equality benchmark is set at 0.9445, and in the case of healthy life expectancy the equality benchmark is set at 1.06.6 Truncating the data at the equality benchmarks for each assigns the same score to a country that has reached parity between women and men and one where women have surpassed men.

Limitation of data/ data source

The measure has so much bias towards women to the extent that, in future, advantages to women that are not factored in calculating the score might lead to biased data. Another drawback is the absence of any indicators capturing differences between the participation of women and men at local levels of government.



Annex 1: COMWARN CANDIDATE INDICATORS FOR THE COMESA REGION

Indicators linked to Demography		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
High population density countrywide; rapid demographic growth; radicalised and/or militarised youth; extreme demographic stress; limited birth control	May lead to competition over resources and conflict; while youth bulge may propagate conflict especially if radicalised or militarised	Population: density, growth rate, youth bulge, dependency ratio
Indicators linked to Economic factors		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
Terms of trade	Government has less to spend on services and the ensuing deteriorating conditions leads to dissatisfaction and vulnerability and possibly to conflict	Terms of Trade; balance of trade; contribution of Agriculture to GDP; government revenue
Inflation	Cost of living becomes unbearable and may lead to riots and conflict	Consumer price Index (CPI)
Over dependency on the agricultural sector; low prices for agricultural produce	May result in economic stagnation, regression hence acceleration of poverty and vulnerability to conflict. Perpetuation of poverty; Vulnerability to international markets and reduced government revenue weaken state to provide services and cause dissatisfaction	Ratio of Agric to GDP; agricultural commodity price index; Global commodity prices; list and value of exports
Lack of sufficient arable land; unequal land distribution	Competition over land use; and discontent over perceived marginalisation	Land use disaggregated per total surface area; available arable land over number of persons depending on Agriculture
Limited government investment in Agriculture	Low productivity; low incomes create environment for conflict	Commitment to CAADP; Ratio of capital investment
Foreign Debt	Drain on resources that could be used to provide services	Debt service ratio

Dependence on foreign aid	Inability to make autonomous decisions and inability to budget	Ratio of foreign aid to overall development budget; foreign aid to recurrent expenditure
Low energy consumption	Low productivity; high unemployment	Energy consumption per capita
Labour force participation rate	Can escalate conflicts, presents avenues for recruitment	Total factor productivity
Harsh living conditions; disparities in income and widespread poverty	Disparity of income in low income countries leads to dissatisfaction and hence may lead to conflict; income distribution and poverty can be politicised	Poverty, Income distribution (Gini coefficient); <i>per Capita</i> GDP
Predatory investment and trade practices by transnational corporations (TNCs)	Weakening of national economy and promotion of illegal exploitation and trade in natural resources; create resentment among the society (population) and encourage emergence of armed groups (to protect armed miners); perpetuation of war economies/ warlordism	Legal provisions to fight against illegal NRE; labour laws and investment laws, conventions and treaties
Large infrastructure development projects	Revenues from grand infrastructure may be used to polarise populations through uneven distribution of gains	Environmental impact assessments; popular participation
Lease of large-scale Agricultural land	Reduction of productive land available to populations and lack of popular participation in decision making may lead to dissatisfaction, resentment and conflict;	Ratio and location of leased land and number of lease agreements; challenges in courts of law
Shared water resources	With increasing water stress, there will be competition over shared waters that could lead to violent conflict	Disputes over shared water resources; treaties; water usage
Capital flight and collapse of banking system	Production decline, prices increase and shortages of essential commodities and may lead to riots and violence	Capital flows; number of banks; access to credit
Food insecurity	Various factors such as droughts, limited labour supply due to forced conscription result in food insecurity and ultimately to dissatisfaction and conflict; food insecurity may also drive governments to seek land from other countries and may result in conflicts with local population in host country	Policies; tax regime; flow of food aid
Limited opportunities outside the state	Competition for state control is fierce and can degenerate into violent conflict	Public: private ratio contribution

Consumption of/ dependence on stimulants	High demand on stimulants such as Khat is increasing its price and causing farmers to uproot other cash crops that support food insecurity; also resulting in lower school enrolment; is also having an impact on the consumers productivity and over-dependence on producer countries	<i>Khat</i> exports and imports
Indicators linked to Political factors		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
Restructuring of economy, state and society	Loss of livelihood, change in power relations, dissatisfaction and grievances that can lead to conflict	Number of policies related to reforms i.e. SAPs and restructuring (involving state withdrawal)
Bloated government	Polarisation, and incapacitating the government and drain on resources	Ratio of recurrent to development expenditure
Electoral/political systems	Zero-sum political systems; checks and balances compromised to the detriment of the democracy; resistance and lack of commitment to political and electoral reforms; undertaking token reforms	Electoral conflicts, tensions; coalition governments
Independence of the Judiciary	Breakdown of the rule of law	Source of funding for the Judiciary, Process of appointment of the High Court Judges
Independence of the Parliament	Lack of independence leads to ineffective representation	Censure motions against Executive; Constitutional provisions promoting or protecting independence; summoning of Ministers to explain executive action; number of commissions set up to probe excesses of executive
Weak or inactive Civil Society	Citizens lack voice to advocate for them; CSOs mediatory role absent or weak hence bottled anger and repression may lead to conflict	Laws on CSOs; registration and deregistration of CSOs

Cross border identity and national problems (centrifugalism and irredentism)	Overlapping of identity and national interests	Tensions between countries; centrifugal incidents; regional associations and movements
Injustice and unequal distribution of resources	Creates social tension; election results producing poor unrepresentative leadership	Corruption index, development plans and indexes, elections outcomes; annual budget allocation; extent of decentralisation
Human rights violation	Creates social tension; election results producing poor leadership	established Human Rights Commissions; number of cases reported/ resolved
Media freedom	Lead to other sources of information dissemination and propaganda that may fuel conflict; absence of outlet or avenue for grievances lead to conflict	Freedom house index; number of independent media houses; number of journalists charged, detained, harassed, killed; law regulating media
Hybrid types of conflicts which although identified as one types of conflict encourage their diversification into militia problems, terrorism and possible genocide	Emergence of militia that can be recruited for violence and used for terrorism and genocide or application of excessive force	Number and support to militia groups; including subscription; politicized and institutionalised militia groups
Access to ports (landlocked countries) and international information highway	Landlocked countries are vulnerable to instability occurring in countries they rely on for access to the sea	Stability in neighbouring countries
Existence of semi-autonomous regions with state	"regions" may feel that autonomy is not genuine devolution and may fight for greater autonomy or even self determination	Low level conflicts and riots targeted at central government; budget allocation
Autonomy/separation	Effect of other dissatisfied groups on autonomy and separation may be new conflicts over separation; expectations of separation not well managed could lead to frustrations, tension and conflict	Regions expressing separatist sentiments
Unfulfilled expectations and general despair	People lose hope and may become desperate and frustrated and look for non-legal ways to address their concerns and grievances	Riots; demonstrations; uprisings; strikes

Constitutional changes	Changes of the constitution to benefit interest groups without popular participation may lead to feelings of dissatisfaction and may lead to rising tension even when done legally; a second factor is violation of the constitution i.e. unconstitutional change of government may lead to open violence	Incidents of constitutional amendments; actions deferred to Courts of Law; acrimonious debates on constitutional issues;
Legitimacy through levels of electoral participation	Level of confidence in electoral systems and legitimacy of government	Voter turnout
Lack of intra-party democracy; Fragmented opposition; Floor crossing dynamics	No credible opposition offering alternative leadership; Political opportunism that may lead to instability and political tensions	Number and size of opposition groups; number of crossings
The cohabitation of the coalition government especially in the run-up to elections	Tensions between coalition partners get deeper towards election year that may lead to violence	Statements; cohesiveness of government;
Existence of political space for social / political groups and their platforms	Polarisation of society leading to grievances	Number of active political parties; number of identify based political parties and social groups
Indicators linked to international factors		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
Trade-distorting practices in neighbouring countries i.e. allowing smuggling of goods	Flight of capital and resources to neighbouring states denying the state revenue and encouraging illegal trade and war economies	Export rules; exports vis a vis application of certification of origin; adherence to Certification mechanism
Taking sides in the ethnic controversies by the political leaders of the region	Exacerbating existing tensions, polarising the society	Political party manifestos, political alliances, political statements
Performance in prosecuting those suspected of involvement in crimes against humanity	Feelings of injustice among victims leading to extra judicial means for revenge	Formation of pressure groups, judicial reports, case logs of suspects
Quality of International Linkages - isolation of state	Vulnerability to external capture or intervention due to isolation and size make them more vulnerable to shocks	Foreign policies; external linkages; pacts

Access to modern information communications technology (ICT)	Easy mobilisation for action; wide transmission of hate mail	Penetration of ICT
Transnational organised crime linked to (local and international) vested interests	Destabilisation and distortion of economy	Reported cases, incident, complaints; prevention strategies; convictions; assassinations; questioned awards of tenders/contracts
Dependence on remittances from Diaspora	Large populations not able to fend for themselves leading to unpredictable income sources; remittance used to purchase weapons of war and to sustain poor policies and conflict. Diaspora discontent and the discontent may lead to conflict	Remittances
Mutual destabilisation between states	Destabilisation including tensions between states that can degenerate or transform to armed conflict within the state or between states	Support for armed groups
Performance of neighbouring economies	Over-dependence of a country on another country leaves the country vulnerable to the shocks and economic performance of the other country and such sudden and uncontrollable factors may lead to collapse of state; participation in other CUs and spill over effects	Economic performance of neighbouring countries
Large number of refugees hosted in neighbouring countries and living in extreme poverty; incursions of troops from neighbouring country; spill over from instability in neighbouring state crisis; continued military presence based in other countries and support of proxies	Scape-goating, witch-hunting, blaming ethnic communities, institutionalised negative policies, blaming identity differences for discrimination, reservoir for recruitment in conflict; proliferation of SALW; illicit and illegal trade; competition over scarce resources.	Number of refugees/returnees, IDPs, number of incursions and casualties
Failed conflict mitigation by the international community	Exacerbating existing tensions	Failed outcomes

Statements/policies by neighbouring states in support of the candidates in pending elections; international/ external support to a regime; direct foreign influence of the events in a country;	Entrench internal opposition groups, create dissatisfaction among citizens against the regime and accentuate existing tensions	Opinion polls, emerging political alliances, diaspora remittances, donor support, military support
Indicators linked to Security		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
High level of militarization; weak regulatory regimes for arms trade, mercenaryism and possible spill over;	Mass retrenchment of security personnel; militarization of politics	Military expenditure on security agents; ratio of military to general population; types of security services; number of private security providers
Presence of militia, perceived as major security concern	Presence of militia make the violent escalation of conflicts more likely	Militia groups
Incomplete DDR programmes; poorly executed post conflict reconciliation	Failed expectations of the demobilized pose a risk of disgruntlement and insurgency; on PCR – relapse to conflict if not well addressed and reprisals and revenge	Number and status of demobilized persons; post conflict reconstruction initiatives
Existence and proliferation of SALWs in society	Availability of easily accessible SALWs makes violent escalation of conflicts more likely	Prevalence of SALW, tensions in bilateral relations,
Humanitarian and other aid functions	May have a role in exacerbating conflicts if not implemented in a conflict sensitive manner	Cases of expulsion of aid workers; looting of food stores; deliberate targeting aid workers
Landmines and other explosive remnants of war prevalence	Returnees compete over available arable land	Extent of demining activities

Competition between groups; pastoralists and agriculturalists; different tribal groups; regions; and a combination of all these; including cultural practices; absence or ineffective traditional conflict resolution strategies	Tensions over resources that lead to violent conflict; Cultural dimension of cattle rustling; commercialization of cattle rustling leading to cyclical cattle rustling.	IDPs, movements of pastoralists; cases of rustling; existing traditional conflict resolution mechanisms, cases resolved through traditional mechanisms
Illegal economy as militias takes over public services and security (vigilante groups) and levying of illegal taxes.	Strengthening of militia groups and weakened confidence in police; weakening of state authority; increased incidents of citizens taking the law into their own hands as citizens lose faith in police and judicial system; increased level of organized crimes such as carjacking and kidnapping for ransom	Number of militia and extent of operation; number of private firms offering security services; regulation of private security providers
Effects of piracy	Piracy is raising insecurity in the region; disrupting and distorting the economy and promoting war economies;	Ships captured;
Indicators linked to Social factors		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
Prevalence of HIV and AIDS	Impact on delivery of security services; reduced productivity; impact on national security budget	HIV and or AIDS prevalence
Sexual and Gender Based Violence	Breakdown of fabric of society; perceived as weapon of war and power symbol leading to abuse and conflict	Cases reported, convictions
Illiteracy	Perpetuation of poverty; illiterate population easy to manipulate and recruit into conflict	Illiteracy rate
Inadequate basic social services such as education and/or health care facilities	Uprisings and riots against the system and legitimacy crisis	Ratio of expenditure on basic social services to GDP
Rural/Urban disparities	Inability to absorb increased populations and proliferation of peri-urban areas/informal settlements which are potential location for conflicts	Urbanization rate; rural urban migration

Social economic stratification and unequal access to education	Creation of an elitist segment and dissatisfaction among the society, class wars	Number of elitist schools, number of expatriate teachers, rate of attrition of the teaching core from public to private schools, distribution of scholarships.
Economic exploitation and human rights violations of the poor, women and children	Marginalization and exclusion lead to resentment and frustration and may be ground for violent rebellion	Reported cases; cases successfully prosecuted; legislation; policies
General disregard for value systems and political culture	Increasing disregard to norms or existing value systems leading to social tension	Corruption index; violence index; vetting practices
Ethnicism	Politicization of ethnicity and use to justify political action, ethnic politics; also linked to resource and power conflicts	Ethnic alliances; Stratification of ethnic groups; Political declarations
Indicators linked to environmental factors		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
Shared resources	May cause conflicts over the transnational resources such as oil	treaties, agreement, usage
Rate of deforestation	Food insecurity	Ratio of forest to land
Risks on access to vital resources like water	Water scarcity lead conflict	Policies (i.e. on water management)
Natural disasters recurrence	Impact of natural disasters such as typhoons and cyclones may lead to competition over resources	
Drought cycles, climate change particularly to pastoralist communities including risks of human and animal pandemic	Competition over water and allied resources	Rainfall patterns, global warming index

Indicators linked to historical factors		
Factors	Theoretical link to conflict	Candidate indicators for COMWARN
Legacy of conflicts	Where conflict and violence has been prevalent, probability for resurgence is high	Number of incidents of violent conflicts per year
Indicators linked to cross cutting issues		
Vulnerability in gender inequality	Gender inequality and bias could cause discontent and with increasing awareness on historical gender inequality may lead to unrest	Participation of women at all levels of governance; participation in politics and key decision-making positions; affirmative policies
Unclear and contested territorial boundaries	Contest over borders may lead to violent conflict	Extent of border demarcation and delimitation; public dialogue about boundaries







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