

# Research Ecosystem Strengthening through the Development of a Public Affairs Index to Support the Devolved System of Government in Kenya

## KIPPRA Public Affairs Index Manual

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# TABLE OF CONTENTS

ACKNOWLEDGEMENTS .....	ii
1. INTRODUCTION .....	1
1.1 Background information .....	1
1.2 Objectives of the manual .....	2
1.3 Concepts and Scope Public Affairs Index.....	2
1.4 KIPPRA Public Affairs Index.....	2
1.5 Who is the manual for?.....	2
1.6 Structure of the manual.....	3
1.7 Choice of Indicators .....	3
1.8 Computation of the PAI .....	4
1.9 Data Sources .....	5
2. FISCAL MANAGEMENT.....	6
2.1 Fiscal Management in the County Governments.....	6
2.2 Relevance of the Selected Indicators.....	6
2.3 Computation of the Key indicators of fiscal management .....	7
2.4 Test Reliability Results for Fiscal Management Indicators.....	10
3. ECONOMIC PERFORMANCE.....	11
3.1 Key Indicators of economic performance .....	11
3.2 Relevance of the Selected Indicators.....	13
3.3 Test Reliability Results for Economic Performance Indicators.....	13
4. HUMAN CAPITAL DEVELOPMENT .....	14
4.1 Key indicators of human capital development.....	14
4.2 Relevance of the Selected Indicators.....	16
4.3 Test Reliability Results of Human Capital Development Indicators.....	16
5. ESSENTIAL INFRASTRUCTURE.....	17
5.1 Key indicators of essential infrastructure .....	17
5.2 Relevance of Selected Indicators.....	19
5.3 Test Results of Essential Infrastructure Indicators .....	20
6. ENVIRONMENT MANAGEMENT .....	21
6.1 Key indicators of environmental management .....	21
6.2 Relevance of Selected Indicators.....	23
6.3 Reliability Test Results for Environment Management Indicators.....	24
7. CRIME AND JUSTICE .....	25
7.1 Key Indicators on crime and justice .....	25
7.2 Relevance of Selected Indicators.....	25
7.3 Reliability Test Results for Crime and Justice Indicators .....	26

8.	TRANSPARENCY AND ACCOUNTABILITY.....	27
8.1	Key Indicators for transparency and accountability .....	27
8.2	Relevance of the Selected Indicators.....	28
8.3	Reliability Test Results for Transparency and Accountability .....	28
9.	WATER SANITATION AND HYGIENE (WASH) .....	29
9.1	Key indicators on WASH .....	29
9.2	Relevance of the Indicators Selected.....	30
9.3	Reliability Test Results for WASH .....	30
10.	SOCIAL WELFARE .....	31
10.1	Key indicators for effective social welfare systems .....	31
10.2	Relevance of the Selected Indicators.....	34
10.3	Reliability Test Results for Social Welfare Indicators .....	35
11.	COMPUTATION OF THE OVERALL PUBLIC AFFAIRS INDEX .....	36
	How was the PAI finally computed? .....	36
	REFERENCES .....	38

# 1. INTRODUCTION

Indices are used in economics and governance sectors to measure, monitor and evaluate progress in the delivery of public goods and services. Indices are also critical in gauging public (dis)satisfaction with government provision of essential services critical to human development. In Kenya, the delivery of public goods and services is the mandate of the national government as well as the 47 county governments. The Kenya Constitution provides for public participation in the prioritisation and co-production of development budgets for effective delivery of public goods and ownership of these goods/services by citizens. The Public Affairs Index (PAI) developed by the Kenya Institute of Policy Research and Analysis (KIPPRA) is a multi-dimensional measurement of government performance and citizen's satisfaction in the provision of key public services at the county level. PAI is a data-driven measurement of the performance of County Governments against nine selected criteria (Pillars).

The project that generated work on the PAI demonstrates the role of KIPPRA, as a think tank and research intermediary, in strengthening frameworks and tools for coordinating key stakeholders in the research ecosystem in Kenya to dialogue, network and enhance research uptake to inform the implementation of the devolved system of government. Through the project, five ecosystem strengthening goals have been achieved, as part of the RISA Fund, namely the building of human capital for the research stakeholders involved, enhancing research uptake into policies and regulations at the national platform as well as county level, equitable and inclusive participation devolved to each of the 47 counties, the networking of assets to drive collaboration between research actors and policy makers, and providing incentives for high quality research.

Hence, based on the RISA project, this manual provides detailed indicators in the framework across nine pillars, namely fiscal management, economic performance, human capital development, essential infrastructure, environmental management, transparency and accountability, crime and justice, water sanitation and hygiene (WASH), and social welfare.

## 1.1 Background information

The Constitution of Kenya provides for the management of public resources through the National Government and the 47 County Governments. Management of public resources as prescribed in the constitution is a citizen-led co-production process of ideas and their execution as per the wishes of the citizenry. The KIPPRA Public Affairs Index therefore serves as a measurement of public satisfaction in the delivery of essential public good and services as per a prescribed criterion. Indices that measure public perceptions/satisfaction in delivery of public goods and services is new in Kenya but has been institutionalized in other jurisdictions such as India (Drishti 2021). In developing the PAI, KIPPRA identified nine key pillars (areas) of resource management and utilisation at the County level. These include fiscal management, economic performance, human capital development, essential infrastructure, environment management, crime and justice, transparency and accountability, social welfare and water, sanitation and hygiene (WASH).

In measuring the performance of the County Governments on the above criteria, PAI seeks to evaluate resource utilization as it relates to the delivery of key services demanded by citizens. The PAI Manual in this regard enables the understanding of the PAI Index.

## **1.2 Objectives of the manual**

The manual aims to fulfill the following key objectives:

- i) Create public awareness on the KIPPRA Public Affairs Index and promote its use and application
- ii) Enable the dissemination of the KIPPRA Public Affairs Index across all stakeholders
- iii) Outline basic principles for measuring the delivery of public goods and services by County Governments in Kenya

## **1.3 Concepts and Scope Public Affairs Index**

Windsor (2001) argued that public affairs is the interactions between the legislative and executive arms of governments in the allocation of resources and oversight over the utilization of those resources for the benefit of the citizenry. Public affairs therefore entail citizens' voices in the day-to-day management of public resources. Public affairs in Kenya entail citizen interest in the allocation, distribution, and evaluation of resource use within the national and County Governments. Kanyinga (2014) argued that citizens participation in public affairs is one of the hallmarks of democratic societies. Chapter six of the constitution of Kenya (GoK 2010), addresses itself to the need for integrity in management of public affairs. Public affairs in the Kenyan sense therefore imply citizen's resources such as taxes, land, critical infrastructure, flora and fauna, minerals that can be used to enhance the living standards of the Kenyan people.

## **1.4 KIPPRA Public Affairs Index**

In 2019, KIPPRA conducted its first County Business Environment for Medium and Small-scale Enterprises Framework (CBEM). CBEM data obtained from the Counties-also served as the building-blocks of the KIPPRA Public Affairs Index that seeks to present a multi-dimensional measure of performance of counties in the delivery of public goods on their devolved functions. The index is important in the sense that it is used by KIPPRA as the tool for analysing County Governments performance in Kenya. The KIPPRA Public Affairs Index is therefore based on identified key development pillars. These are:

- |                                |  |
|--------------------------------|--|
| i) Fiscal management           | vi) Crime and Justice                    |
| ii) Economic performance       | vii) Transparency and accountability     |
| iii) Human capital development | viii) Social welfare                     |
| iv) Essential infrastructure   | ix) Water, Sanitation and Hygiene (WASH) |
| v) Environmental management    |  |

## **1.5 Who is the manual for?**

Demand for government accountability to its citizens in the delivery of public goods and service is increasing. The devolved governance system that aims at among other things to bring development and government services closer to the citizens has also increased the

need to measure the capacities of government departments to deliver. Public Affairs Index is therefore intended to be a reflective mirror through which citizens and governments in Kenya can look into their performances within a specified period of time i.e. annually or bi-annually. The manual is therefore a tool to enable comprehensive understanding of the public affairs index. It is aimed to enable deeper understanding of the delivery of public goods to citizens. It aims to be used by government officers within the governance and economic development sectors. It will also be useful for researchers and policy analysts that want to evaluate the performance of specific County Governments as per the Public Affairs Index. Private sector organisations and civil society may also use the manual to delve into the infrastructure provided by government to support service delivery.

## **1.6 Structure of the manual**

This manual is organized in line with the KIPPRA Public Affairs Index (PAI). Each Pillar outlines the indicators measured and the justification for the choice of the indicators. Part A focuses on fiscal management as first pillar of PAI, Part B delves into economic performance pillar of PAI. Part C looks into human capital development looks into human capital. Part D looks into essential infrastructure. Part E focuses on environmental management pillar. Part F, focuses on crime and justice. Part G is on transparency and accountability. Part H is on social welfare. Part I looks into water, sanitation and hygiene (WASH). Lastly, part J looks into the computation of the PAI indicators.

## **1.7 Choice of Indicators**

The indicators chosen to measure the KIPPRA Public Affairs Index were selected based on their universality as identified in the sustainable development goals (SDGs) and Kenya's economic blueprint, Vision 2030. The indicators were also chosen to reflect the key functions of the county governments as spelt out in Schedule Four of the constitution of Kenya. Principal Component Analysis (PCA) and Cronbach's Alpha were applied to validate the selected variables and ensure compliance with statistical requirement for index computation. The Cronbach's alpha measures the reliability or internal consistency of a set of scale or test items by predicting the strength of that consistency. It was computed by correlating the score of each scale item with the total score for each observation, and then comparing it to the variance for all individual item scores. The Cronbach alpha results range from 0 to 1 in providing the overall assessment of a measure's reliability.

The rule of thumb is that:

- a) If  $\alpha = 0$ , implies all of the scale items are entirely independent from one another, that is, not correlated or share no covariance.
- b) If  $\alpha = 1$ , Implies as the number of items in the scale approaches infinity, that is, the higher the coefficient, the more the items have shared covariance and probably measure the same underlying concept.
- c) Alpha coefficients of below 0.5 are unacceptable.
- d) Between 0.65 and 0.8 (Or higher in many cases), presents a good coefficient (Pallant, 2020).

Even though there are no universally accepted indicators in gauging public affairs, the choice of PAI indicators was guided by the following key factors:



### **1.7.1 Relevance to PAI objectives**

The overall objective of PAI is to measure performance of counties on the delivery of public services in the devolved functions. PAI indicators must therefore be relevant to the objectives of the County Governments in terms of provision of fiscal management, economic performance, environmental management, health, education, water, and sanitation among other functions as defined in the constitution.

### **1.7.2 Clarity**

The indicators chosen per pillar were intended to capture the tenets of County Governments responsibilities as defined in the Constitution of Kenya. Each indicator therefore sought to measure a given single area of resource distribution from the County Government to the citizens.

### **1.7.3 Feasibility of future data collection**

The selected indicators were also chosen based on the reliability of information that could be obtained and verified from different sources within the County Governments and other stakeholders including citizens. In the computation of the PAI, two reliability tests were conducted, that is, the Cronbach's alpha test and the Principal Component Analysis (PCA). These tests were important in gauging whether the indicators included in the computation of the index conforms with the reliability and consistency statistical requirements.

### **1.7.4 Action focused**

The PAI indicators sought to gauge County Government actions/responsibilities against set national targets in different sectors. The indicators chosen therefore enabled the measuring of government delivery of public goods and services. These ranged from the development of laws and regulations to guide public affairs to the delivery of primary healthcare milestones.

## **1.8 Computation of the PAI**

The PAI computation was undertaken in a two-stage approach: the first stage involved transformation of raw data from different sources into percentages and rates that are comparable across the counties, the second stage was to transform the percentages into scores on a scale of 0 to 1 using an adapted Distance to Frontier methodology. The methodology was adapted so that the County performance on the indicators was measured against national aspirations as captured in different best practices such as Vision 2030, sustainable development goals, Kenya's ratified treaties and conventions and government set targets. The overall PAI index was computed through a simple equal weighted average of the 9 pillars. See the formulae below:

$$PAI\ Index = \frac{Fiscal\ management + Economic\ performance + Human\ Capital\ Development + Essential\ Infrastructure + Environment\ management + Transparency\ and\ Accountability + crime\ Justice + WASH + Social\ welfare}{9\ (number\ of\ indicators)}$$

## **1.9 Data Sources**

Development of PAI involved the use of secondary sources. These were obtained from Kenya National Bureau of Statistics 2019 Census (KNBS 2019), Kenya Demographic Health Survey of 2014 (KNBS 2014), the Kenya Integrated Household Budget Survey (KIHBS 2018) the Gross County Product (KNBS 2019), reports from the Office of Controller of Budget and FINACCESS data. This was augmented by primary data collected in the Counties using Key Informant Interviews' from all the 47 County Governments. The respondents were drawn from technical officers in the departments of Environment, Budgeting and Planning, Health, Social welfare, Devolution and Public Administration and Agriculture.

The data sets from different secondary sources were standardised by comparing the base year period as well as controlling for known shocks or business cycles.

## **2. FISCAL MANAGEMENT**

Fiscal Management systems entails the processes of financial planning, budgeting, and accounting for public resources as anchored in the constitution of Kenya 2010 through several Acts of Parliament. The Public Procurement and Asset Disposal Act of 2015, the Public Finance and Management Act of 2012 and the County Government Act of 2012 form the backbone of key policy documents that guide the use of public resources both at the County and National levels. The indicators applied in assessing the performance of County Governments in fiscal management include; compliance to PFM regulations, pending bills, budget execution and resource mobilization.

### **2.1 Fiscal Management in the County Governments**

The Controller of Budget is mandated through the Controller of Budget Act of 2016 to authorize the withdrawal of County Revenue Funds by County Governments. The County Government Act of 2012 provides for the establishment of the 47 County Governments as prescribed in the Constitution. Section 8 of the County Governments Act outlines the roles of County Assemblies, these including the approval of budgets and expenditures at the County-level. Section 108 of the County Governments Act provides for the preparation of County Integrated Development Plans (CIDP). CIDP is the County's strategic plan that outlines its development priorities and resources. In, 2021, the County Revenue Allocation Act was enacted by the Senate. The County Revenue Allocation Act is to oversee the equitable allocation of national revenue to the County Governments and facilitate the transfer of allocated funds to the Counties. Section 137 of the Public Finance Act of 2012 also established County Budget and Economic Forums (CBEF). The CBEF is a County-level consultative forum (public participation) on the budgeting process.

### **2.2 Relevance of the Selected Indicators**

The Public Finance Management framework supports fiscal decentralization by outlining the resource mobilization and expenditure management in public sector thus an integral part of the development process. The PFM provides for a ratio of 70:30 spending ratio of Recurrent to Development expenditure. High score on resolving pending bills shows compliance with provisions of Section 96 of the Public Finance Management Act and Article 225 of the Constitution enforces payments of financial commitments and obligations by County Governments. Budget execution is critical to understanding of service delivery to citizens. Reports from the Office of the Auditor General indicate multiple cases of poor budget execution leading to loss of tax payers' money. Poor budget execution further hinders the delivery of public goods and services to citizens. The revenue mobilization indicator demonstrates the strategy and capacity of the County Government to generate own resources to complement national government allocation.

Compliance to PFM regulations is critical to the delivery of public goods and services to citizens both at the National and County Governments'. The Public Finance Management Act of 2012 established County Treasuries and provides a legal and institutional framework for the establishment of County Fiscal Strategy Papers that are critical in the budgeting processes.

Chapter 9 of the Constitution of Kenya provides for the establishment of the Executive arm of the government that oversees the day-to-day planning and management of public resources on behalf of the citizenry. The Executive arm of government includes the national and 47 County Governors. Chapter 11 of the Constitution of Kenya established the devolved government structures; the 47 Counties as sub-national units responsible for the management of public resources within their respective jurisdictions. Chapter 12 addresses itself to Public Finance and outlines the criteria upon which public finances should be expended.

Chapter 15 of the constitution also established two independent offices: The Office of the Auditor-General and the Office of the Controller of Budget. The Auditor General is responsible for the monitoring accountability of public expenditure (audit). The Controller of Budget on the other hand is responsible for providing oversight in the implementation of both County and National Governments budgets. Management of public revenue in Kenya is dictated by the Public Finance and Management Act of 2012. Among other things, it provides for the modalities through which County Governments spend public resources disbursed to them from the National Treasury. It also establishes public revenue versus public expenditure ratio.

## 2.3 Computation of the Key indicators of fiscal management

This pillar was measured by 4 sub-pillars the first being compliance with PFM regulations measured by two indicators: compliance to PFM regulations on development expenditure (PFM Regulations 2015) and compliance to personnel emolument to total revenue ceiling (PFM regulation 2015). Secondly, resolve on pending bills measured by recurrent pending bills to total recurrent expenditure, Development expenditure pending bills to total development expenditure. Budget execution measured by development expenditure budget execution and recurrent expenditure budget execution. And lastly revenue mobilization measured by ratio of OSR share to equitable share, Achievement of own source revenue targets, OSR Regulatory framework index and Revenue management index. The index for this pillar was computed by using an arithmetic mean of the sub-pillars as shown in the formulae below;

$$\text{Overall PAI Index} = \frac{\text{Compliance to PFM regulations} + \text{Resolve on pending bills} + \text{Budget execution} + \text{Revenue management}}{4 \text{ (number of indicators)}}$$

### 2.3.1 Compliance with PFM regulations

- Measured by establishing the percentage of development expenditure to total expenditure.
- Measured by establishing the percentage of personal emoluments to total revenue.

**Table 1: Computation of Compliance to PFM regulations scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Compliance to PFM regulations on development expenditure (PFM Regulation, 2015)</b>	<p>Percentage of total actual development expenditure to total actual expenditure 2013/14 to 2020/2021</p> $A = \frac{\text{Total actual development Expenditure (2013/14 to 2020/21)}}{\text{Total actual expenditure (2013/14 to 2020/21)}}$ <p>Average percentage of total actual development expenditure to average total actual expenditure.</p>	<p>Use of Distance to frontier (DTF)</p> $\frac{\text{Worst} - A}{\text{Worst} - \text{frontier}}$ $= \frac{0 - A}{0 - 30}$ <p>Where, 0 per cent is the worst, A is the unit of the indicator, and the frontier is 30 per cent (benchmark) - which is provided in the PFM regulation, 2015.</p>

<b>Compliance to personnel emolument to total revenue ceiling (PFM regulation, 2015)</b>	$B = \frac{\text{Personnel Emolument}}{\text{Total revenue}} \times 100$ <p>Percentage of personnel emolument to total revenue for every year. Then, transform B into compliance equal to 1, and non-compliance equal to 0. If <math>B \geq 35\%</math>, then <math>B = 0</math>, if <math>B &lt; 35\%</math>, then <math>B = 1</math>.</p> <p>Count the number of years between 2013-2021, which have complied with the PFM regulation 2015 of 35 per cent ceiling in personnel emolument</p>	<p>Further, using the DTF the following formulae was used:</p> $\frac{\text{Worst} - A}{\text{Worst} - \text{frontier}}$ $= \frac{0 - A}{0 - 8}$ <p>Where, 0 is the worst which implies the 0 number of years not complied with the PFM regulation. The frontier is 8, implying that in the 8 years, the county had complied in all the years as provided for in the PFM regulation, 2015. While A is the unit of the indicator.</p>
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### 2.3.2 Pending bills

- Measured by establishing the percentage of Recurrent pending bills to total recurrent expenditure.
- Measured by establishing the percentage of development expenditure pending bills to total development expenditure.

**Table 2: Computation of Resolution of Pending Bills Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Recurrent pending bills to total recurrent expenditure</b>	<p>Percentage of total recurrent expenditure pending bills to total recurrent expenditure (average for 2014/15-2020/21) is given by:</p> $A = \frac{\text{Total Recurrent pending bills (2013/14 to 2020/21)}}{\text{Total recurrent expenditure (2013/14 to 2020/21)}} \times 100$	<p>Use of Distance to frontier (DTF)</p> $\frac{\text{Worst} - A}{\text{Worst} - \text{frontier}}$ $= \frac{100 - A}{100 - 0}$ <p>Where, 100 per cent is the worst, A is the unit of the indicator, and the frontier is 0 per cent pending bills (benchmark).</p>
<b>Development expenditure pending bills to total development expenditure</b>	<p>Percentage of development expenditure pending bills to total development expenditure is given by:</p> $A = \frac{\text{Development Expenditure pending bills(2013/14 - 20/21)}}{\text{Total development expenditure (2013/14 to 2020/21)}} \times 100$	<p>Use of Distance to frontier (DTF)</p> $\frac{\text{Worst} - B}{\text{Worst} - \text{frontier}}$ $= \frac{100 - A}{100 - 0}$ <p>Where, 100 per cent is the worst, B is the unit of the indicator, and the frontier is 0 per cent (benchmark). That is, counties with low pending bills are awarded more scores.</p>

### 2.3.3 Budget Execution

- Measured by establishing the development expenditure absorption rate.
- Measured by establishing the recurrent expenditure absorption rate.

**Table 3: Computation of Budget Execution Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Development expenditure budget execution</b>	<p>Percentage of development expenditure budget execution is given by the actual development expenditures divided by total actual expenditures (exchequer releases).</p> $A = \frac{\text{Actual Development Expenditure (2013/14 - 20/21)}}{\text{Total development budget allocation (2013/14 to 2020/21)}} \times 100$	<p>Use of Distance to frontier (DTF)</p> $\frac{\text{Worst} - A}{\text{worst} - \text{frontier}}$ $= \frac{0 - A}{0 - 100}$ <p>Where, 0 per cent is the worst, B is the unit of the indicator, and the frontier is 100 per cent (benchmark). That is, as the country aims to achieve 100 execution rate, it gets more scores.</p>

<b>Recurrent expenditure budget execution</b>	<p>Percentage of recurrent expenditure budget execution is given by the actual recurrent expenditures divided by total actual expenditures (exchequer releases).</p> $B = \frac{\text{Actual Recurrent Expenditure (2013/14 - 20/21)}}{\text{Total recurrent budget allocation (2013/14 to 2020/21)}} \times 100$	<p>Use of Distance to frontier (DTF)</p> $\frac{\text{Worst} - B}{\text{Worst} - \text{frontier}}$ $= \frac{0 - B}{0 - 100}$ <p>Where, 0 per cent is the worst, B is the unit of the indicator, and the frontier is 100 per cent (benchmark). That is, counties with high execution rate scores are awarded high marks.</p>
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### 2.3.4 Revenue mobilization

- Measured by establishing the revenue management practices in the County.
- Measured by establishing the share OSR to equitable share.
- Measured by establishing the actual OSR collection to target.
- Measured by establishing the Existence of policies, plans, systems to guide OSR.

**Table 4: Computation of Revenue Mobilization Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Ratio of OSR share to equitable share</b>	<p>Ratio of Own Source Revenue is given by the amount of Own Source Revenue divided by the equitable share.</p> $A = \frac{\text{Total actual Own Source Revenue (2013/14 - 20/21)}}{\text{Total Equitable Shares (2013/14 to 2020/21)}} \times 100$	<p>Use of Distance to frontier (DTF)</p> $= \frac{\text{Worst} - A}{\text{worst} - \text{frontier}}$ $= \frac{0 - A}{0 - 100}$ <p>Where, 0 per cent is the worst, B is the unit of the indicator, and the frontier is 100 per cent (benchmark). That is, as the country aims to achieve 100 per cent ratio of OSR share to equitable share, gets more scores.</p>
<b>Achievement of own source revenue targets</b>	<p>Achievement of own source revenue target is given by the percentage OSR collected divided by the amount of Own Source Revenue targeted in the year.</p> $B = \frac{\text{Total Own Source Revenue collected (2013/14 - 20/21)}}{\text{Total Own Source Revenue Targeted (2013/14 to 2020/21)}} \times 100$	<p>Use of Distance to frontier (DTF)</p> $= \frac{\text{Worst} - B}{\text{worst} - \text{frontier}}$ $= \frac{0 - B}{0 - 100}$ <p>Where, 0 is the worst, B is the unit of the indicator, and the frontier is 100 (benchmark). That is, as the country aims to achieve 100 target collection of OSR, it gets more scores.</p>
<b>OSR Regulatory framework index</b>	<p>Counties were scored on whether they had in place Revenue generation policy, revenue generation plan and revenue mobilisation department which form OSR revenue regulatory framework and Counties awarded a score of 1 if they have in place, 0 if not,</p> <p>If County x has a framework, i.e., Yes = 1, &amp; if No = 0.</p>	<p>Use of Distance to frontier (DTF)</p> $= \frac{\text{Worst} - B}{\text{worst} - \text{frontier}}$ <p>The maximum counts of 3 becomes the frontier, while the least score is 0</p> $= \frac{0 - B}{0 - 3}$
<b>Revenue management index</b>	<p>Counties were scored on whether they were practicing Revenue management best practices namely; Share of development expenditure, Personnel emoluments to total revenue ceiling, Resolve on recurrent expenditure pending bills, Resolve on development expenditure pending bills, Development expenditure budget execution, Recurrent expenditure budget execution OSR share to equitable share, Achievement of OSR targets, OSR Regulatory framework. Counties awarded a score of 1 if had a best practice 0. If not, If County x has a framework, i.e., Yes = 1, &amp; if No = 0.</p>	<p>Use of Distance to frontier (DTF)</p> $= \frac{\text{Worst} - B}{\text{worst} - \text{frontier}}$ <p>Therefore, to compute the index scores 9 becomes the frontier, while the least score is 0</p> $= \frac{0 - B}{0 - 9}$

## **2.4 Test Reliability Results for Fiscal Management Indicators**

To test the reliability, PCA and Cronbach's Alpha were used to measure the performance of each selected indicator. In measuring fiscal management, the following indicators were tested using Cronbach's Alpha: The percentage of Development expenditure to total expenditure, the percentage of personal emoluments to total revenue, the percentage of recurrent pending bills to total recurrent expenditure, the percentage of development expenditure pending bills to total development expenditure, the development expenditure absorption rate, the recurrent expenditure absorption rate, the share of OSR to equitable share, the actual OSR collection to target, the existence of policies, plans, systems to guide OSR and Revenue management practices. This resulted in Cronbach's Alpha scale reliability coefficient of 0.65 with an average interitem covariance of 0.00 This indicate good reliability of the indicators chosen to measure fiscal management. Similarly, the indicators were tested using PCA The results show that the first four (4) components out of the ten (10) components, had eigenvalues greater than 1. These four components explain 71.56 per cent of the variations in the data. In the results, the first principal component analysis has large positive associations with compliance to PFM regulations on development expenditure, recurrent expenditure budget execution, and recurrent expenditure budget execution, and negatively associated with ratio of OSR share to equitable share. While the second principal component has large negative associations with development expenditure budget execution and recurrent expenditure budget execution large positive associations with compliance to personal emolument to total revenue ceiling and OSR Regulatory framework. At least, all the indicators contribute to a larger association with the four components. This, therefore makes all the selected indicators essential in computation of the index.

### 3. ECONOMIC PERFORMANCE

The economic performance of a nation is determined by the socio-political institutions and the technology that drive financial transactions within the particular jurisdiction. Vision 2030, Kenya's economic blueprint envisages economic performance of annual Gross Domestic Product growth of 10%. However, this has not been achieved yet. The indicators applied in assessing the performance of County Governments in fiscal management include; compliance to PFM regulations, pending bills, budget execution and resource mobilization. The pillar index was computed by averaging the scores of the indicators as given in the formulae below;

$$\text{Economic performance} = \frac{\text{Economic growth} + \text{Diversity of the economy} + \text{labour participation} + \text{Business environment} + \text{Financing growth} + \text{Income Equality}}{6}$$

#### 3.1 Key Indicators of economic performance

In the KIPPRA Public Affairs Index (PAI), economic performance was measured using the following indicators:

- Economic growth: this was measured through the Gross County Product (GCP) from 2013-2017. Gross County Product has been defined as “a geographic breakdown of Kenya's Gross Domestic Product (GDP) that gives an estimate of the size and structure of county economies” (Kenya National Bureau of Statistics 2019).

**Table 5: Computation of Economic Growth Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Average GCP growth rate (%) (2013-2017)</b>	<p>The GCP growth rates is derived by:</p> $\text{Average GCP per year} = \frac{\text{Current year} - \text{Past year}}{\text{Past year}} \times 100$ <p>Then, the average for the period is given by:</p> <p>Average total GCP</p> $\text{Average total GCP} = \frac{\text{Sum for GCP growth rates in the 4 years (2014, 2015, 2016, 2017)}}{4 \text{ years}}$ <p>The average total GCP is transformed by checking the proximity to the benchmark.</p>	<p>The benchmark is 10 per cent.</p> <p>The index is computed using the DTF</p> $= \frac{\text{Worst} - A}{\text{worst} - \text{frontier}}$ $= \frac{0 - A}{0 - 10}$ <p>Where, worst is where the county's GCP is 0, the frontier is the benchmark given by 10%. A is an average total GCP for the county. So as the county approaches the 10% benchmark, it gets more scores.</p>

- Diversity of the economy: the contribution of manufacturing to the Gross County Product from 2013-2017.

**Table 6: Computation of GCP contribution per sector index scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Average contribution of Manufacturing to GCP (2013-2017) constant prices (%)</b>	<p>Average contribution of Manufacturing to GCP (2013-2017) constant prices (%) is computed by taking the summation of percentage contribution of manufacturing to GCP. That is;</p> $= (\text{Sum for the share of manufacturing to GCP for 5 years}) / (5 \text{ years})$ <p>The average contribution of Manufacturing to GCP is transformed by checking the proximity to the benchmark.</p>	<p>The benchmark is 15 per cent. The index is computed using the DTF</p> $= (\text{Worst}-A)/(\text{worst}-\text{frontier})$ $=(0-A)/(0-15)$ <p>Where, worst is where the county's average contribution of Manufacturing to GCP is 0, the frontier is the benchmark given by 15%. A is an average contribution of Manufacturing to GCP for the county. So as the county approaches the 15% benchmark, it gets more scores.</p>



- Labour participation: The labour participation rate (%), this implies the number of persons between the ages of 15 to 64 engaged in gainful employment.

**Table 7: Computation of Labour Participation Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Labour participation rate</b>	Total working age population is given by sum of working population from the age of 15 to 64 years in the county. Therefore, labour participation rate is given by: $= \frac{\text{Total Labour force (15-64yrs)}}{\text{Total working age population(15-64yrs)}} \times 100$ Labour participation rate is then transformed into an index	Computation of labour participation index score considers a benchmark of 100%. Such that an increase in rate of a county, increases the score. The index is computed using the DTF $= \frac{(\text{Worst-A})}{(\text{worst-frontier})} = \frac{(0-A)}{(0-100)}$ So the higher the labour participation rate, the higher the scores.

- Enabling business environment: The County Business Environment for Small and Micro-Enterprises (CBEM) Score 2022.

**Table 8: Computation for CBEM Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>CBEM 2022 Scores</b>	CBEM scores is a composite index of 6 themes: worksite and related infrastructure, market environment for MSEs, financial inclusion, technical capacity of MSEs, Governance and regulatory framework, and risk preparedness and management. Each theme is composed of an index of indicators showing how far or near they are to the frontier. See <i>KIPPRA County Business Environment for Micro and Small Enterprises (CBEM) 2022</i>	A score of 100% on County Business Environment for MSEs was the set benchmark and scoring of counties was done on a scale of 0-1. Benchmark is 100% and worst is 0 $= \frac{((\text{worst-A}))}{(\text{worst-frontier})} = \frac{(0-A)}{(0-100)}$

- Financing growth: the percentage citizens with access to finances (capital).

**Table 9: Computation for Financing Growth Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Access to Finance (%)</b>	Access to Finance (%) data was collected from a survey done by Central Bank of Kenya, called FINACCESS survey.	Access to Finance (%) index score was derived by: $= \frac{(\text{worst-A})}{(\text{worst-frontier})} = \frac{(0-A)}{(0-100)}$ Benchmark is 100% and worst is 0

- Income equality: Gini coefficient measures income distribution within a population. A reversed gini coefficient indicate transformation from a more unequal to equal society in terms of wealth distribution.

**Table 10: Computation for income equality Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Income equality (%)</b>	Income equality used data on income inequality from United Nations Office for the Coordination of Humanitarian Affairs (OCHA) website which ranked counties using gini co-efficient	Income equality was derived by: $= \frac{(\text{worst-A})}{(\text{worst-frontier})} = \frac{(100-A)}{(100-0)}$ Benchmark is 0%- perfect equality worst is 100%- perfect inequality

### **3.2 Relevance of the Selected Indicators**

Economic growth was selected as it is an indicator that shows increase in tax revenue that is critical to funding social development programmes in the County. The diversity of economy indicator sought to measure economic performance by assessing the growth of manufacturing industries in line with Vision 2030 and the Big Four Agenda. The indicator showed that in many Counties, the economies are not yet diverse. Labour participation indicator was critical in establishing the workforce capacity available within the County to the collective create wealth and raise taxable revenue that can fund other social development programmes. The enabling business environment indicator was important in establishing the capacity of Counties to nurture its private sector. Financing growth was chosen as it encompasses the ability of the County Governments to increase financial access and financial inclusion to promote inclusive growth across the County. Income equality was applied to measure the probability of citizens within the County to benefit from its economic growth.

### **3.3 Test Reliability Results for Economic Performance Indicators**

To test the reliability of economic performance indicators, Cronbach's Alpha and PCA were applied independently. The following indicators were tested: average Real GCP Growth 2014-2017, the contribution of manufacturing to GCP 2013-2017, the percentage of labour participation rate, the CBEM score for 2022, the percentage of financial access and the reversed Gini coefficient. This resulted into scale reliability coefficient of 0.61 with an Average interitem covariance of 0.00. Thus presenting good reliability of the indicators to measure economic performance. Similarly, PCA was applied to the identified economic performance indicators. The results show the first three (3) components out of the six (6) components, have eigenvalues greater than 1. These three components explain 68.68 per cent of the variations in the data. In the results, the first principal component analysis has large positive associations with the financing growth, enabling business environment and economic diversity (average contribution of Manufacturing to GCP). The second principal component depicts a larger positive relation with labour participation rate, economic growth and large adverse effect on economic diversity. Principal component three has larger positive associations with income equality and larger effect on growth economy. This implies, at least all the selected indicators have significant contributions.

## 4. HUMAN CAPITAL DEVELOPMENT

The Organisation for Economic Co-operation and Development (2001) defined human capital as, “the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic wellbeing”. Human capital development is therefore the process through personal improvements of a people through acquisition of new skills and knowledge can be used to create and generate wealth for the collective good. The selected sub-pillars for measuring human capital development include: health, education and life expectancy. The pillar was computed by averaging the scores of the sub-pillars as shown in the formulae below;

$$\text{Human Capital development} = (\text{Health} + \text{Education} + \text{life expectancy})/3$$

### 4.1 Key indicators of human capital development

#### 4.1.1 Health

Health as an indicator for human capital development is measured by looking into:

- Skilled birth; the percentage of skilled births as captured in sustainable development goals (SDGs). Skilled births attendance as an indicator of capacity, training and investment in skills to lower maternal and newborn deaths.

**Table 11: Computation of Percentage of Skilled Births Score**

Indicators	Calculation of the indicator percentages & Rates	Scoring of the indicators
<b>Percentage of skilled births</b>	<p>Percentage of live births attended by skilled health personnel during a specified period. That is, the number of births attended by doctors, nurses, or midwives trained in providing life-saving obstetric care, including giving the necessary supervision, care, and advice to women during pregnancy, childbirth, and the postpartum period, to conduct deliveries on their own, and to care for newborns.</p> $= (\text{Number of births attended by skilled health personnel}) / (\text{Total number of live births in the same period})$ <p>The data is collected on a routine facility information system; however, household surveys are preferred.</p>	<p>Distance to frontier was used to compute the index.</p> $= (\text{Worst-A}) / (\text{worst-frontier})$ $= (0-A) / (0-100)$ <p>The skilled births index show how far or near the current status of the county is from attaining the 100 per cent benchmark.</p>

- Stunted growth; indicate threats to good health that may inhibit the growth and development of children born within a certain time and place.

**Table 12: Computation for the stunted growth index scores**

Indicators	Calculation of the indicator percentages & Rates	Scoring of the indicators
<b>Stunted Children under-five (%)</b>	<p>Percentage of stunted (moderate and severe) children aged 0–59 months. (Moderate = height-for-age below -2 standard deviations from the WHO Child Growth Standards median; severe = height-for-age below -3 standard deviations from the WHO Child Growth Standards median).</p> $= (\text{Number of children aged 0-59 months who are stunted}) / (\text{Number of children aged 0-59 months who were measured})$ <p>The data is collected during the population-based household surveys in the nutrition modules after 3-5 years.</p>	<p>The non-stunted growth index score is arrived at by:</p> $= (\text{Worst-A}) / (\text{worst-frontier})$ $= (100-A) / (100-14.5)$ <p>Where the worst is when the percentage of stunted children is 100%, and the frontier is 14.5%. according to Vision 2030, Kenya seeks to reduce the stunted growth rate to 14.5%.</p>

### 4.1.2 Education

- Percentage of primary school enrolment: the level of government investment in education which is critical for future economic growth of the County and nation.

**Table 13: Computation of Percentage of primary school enrolment scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Net enrolment ratio (%)</b>	The net enrolment ratio is measured as the number of boys and girls of the age of a particular level of education that are enrolled in that level of education (Pre-primary, primary, secondary), expressed as a percentage of the total population in that age group. For example, the pre-primary education net enrolment ratio (is the number of boys and girls of pre-primary school age (4-5 years) that are enrolled in pre-primary education, expressed as a percentage of the total population in that age group. The primary school age is 6-13 years while secondary school age is 14-17 years.	For this case, we considered Pry net enrolment ratio 2018 (%). $= (Worst-A)/(worst-frontier)$ $= (0-A)/(0-100)$ School enrolment index indicates how far or near the current status of the county is from attaining the 100 benchmark of school enrolment.

- Adult literacy; defined as the percentage of people within a population between the ages of 15 and above who can read and write. Adult literacy enables participation in public affairs decision-making processes.

**Table 14: Computation of Adult Literacy Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Adult literacy - Female literacy rate (%)</b>	Adult literacy rates refer to the percentage of population aged 15 years and over who can both read and write with understanding a short simple statement on his/her everyday life. In the computation of the index, the benchmark was the 100 per cent national target. Therefore, the county adult literacy rates were computed by giving a score based on the proximity to achieving the national target	In this case, we considered female literacy in the computation of the index using the DTF approach. $DTF = (Worst-A)/(worst-frontier)$ $= (0-A)/(0-100)$ Where the worst is when the percentage of female literacy rate is 0%, and the frontier is a 100% (benchmark – where all the literacy is 100%). That is, as the county seeks to reduce illiteracy rates among female, the county score tend to improve.

### 4.1.3 Life expectancy

- Life expectancy; the expected life-span of each gender within a country, district or County. It is used to measure the level of provision of healthcare and other social development programmes that are critical to long, healthy and productive lives.

**Table 15: Computation of Life Expectancy Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Life expectancy in years</b>	Life expectancy at birth measured by the number of years lived. The global aspiration of 85 years, while the Kenya's life expectancy currently stands at 65 years on average and a minimum of 20 years was considered in the computation of the index as the frontier and worst respectively. $= (Male\ life\ expectancy + female\ life\ expectancy)/2$	The average life expectancy index score is arrived at by: $= (Worst-A)/(worst-frontier)$ $= (20-A)/(20-85)$ Where the worst is when the 20 years' life expectancy and world frontier life expectancy is 85 years (benchmark). That is, as the county seeks to enhance life expectancy rate of a country, with a target of 85 years; the index shows how far the county is from attaining the target.

## **4.2 Relevance of the Selected Indicators**

Skilled births indicator was chosen to ascertain the capacity of Counties to attain the national goal of 100% live births. The percentage of non-stunted children was selected to test the Vision 2030 aspiration to reduce the number of stunted children by 14.5 per cent. The indicator on vaccination of children was selected to ascertain Counties performance in regard to the national goal of 100% vaccination of children. It further highlights inhibitions to achieving the national goal. These include: low literacy level, nomadic lifestyle, lack of knowledge on the immunization schedule, low economic status and long distances to the health facilities. Adult literacy rates indicator was chosen to enable PAI to gauge the performance of Counties against the 100% national target. School enrolment indicator was chosen to gauge the capacity of County Governments to provide educational facilities, facilitate learning processes and prepare its future human capital for the labour market. Life expectancy at birth was measured against the global aspiration of 85 years and minimum of 20 years.

## **4.3 Test Reliability Results of Human Capital Development Indicators**

To test the reliability of human capital development indicators, Cronbach's Alpha and PCA were carried out independently on the Percentage of skilled births, the percentage of stunted children, the percentage of Children 12 -23 months fully vaccinated, the adult literacy rates and the percentage of primary school net enrolment. The Cronbach's Alpha produced a scale reliability coefficient of 0.84 with an average interitem covariance of 95.53 thus reflecting strong reliability. Similarly, PCA was also conducted on the same indicators. The results show the first two (2) components out of the six (6) components, have eigenvalues greater than 1. These two components explain 74.95 per cent of the variations in the data. In the results, the first principal component analysis has large positive associations with the percentage of skilled births, literacy rates, and primary net enrolment ratio (%). While the second principal component comprises larger positive associations with percentage of children not stunted, and large negative associations with life expectancy and literacy rates. The results indicate that at least 5 selected indicators contribute greatly to the associations between the data with only percentage of children 12 -23 months fully vaccinated (%) contributing moderately to the changes in the model. Therefore, all the variables are fit to contribute to the development of the index.

## 5. ESSENTIAL INFRASTRUCTURE

Infrastructure is critical for economic growth as it facilitates the delivery of public goods and services to the citizens at various points of need (government offices, markets, health centres, schools) e.t.c. The constitution of Kenya provides for the County Governments to provide for their citizens essential infrastructure to enable movement, accommodation, and communication. Essential infrastructure should therefore be affordable, enable access to key public goods and services, convenient and environmentally sustainable to use for now and in the future. The indicators measured under essential infrastructure include: access to work, transport affordability, permanent housing, internet connectivity, mobile money subscription and access to electricity. The index for the pillar was computed by averaging the scores of the indicators as per the formulae below;

$$\text{Essential Infrastructure} = (\text{Access to Work} + \text{Transport affordability} + \text{Housing quality} + \text{Internet connectivity} + \text{schools's ICT connectivity} + \text{Mobile money subscriptions} + \text{Access to electricity}) / 7$$

### 5.1 Key indicators of essential infrastructure

The Public Affairs Index applied the following key indicators to measure essential infrastructure:

#### 5.1.1 Access to work

This is measured by establishing the average distance to workplace for the majority of citizens within the County.

**Table 16: Computation of Access to Work Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Access to work - Average distance to workplace</b>	The average road distance to workplace is given by the distance between the employee residences and the worksite.	Distance to frontier approach was used in computation of the index. In the computation of the access to work index, there is no standard benchmark for the worst or frontier, therefore for this computation, the frontier (lowest distance), was the county with the lowest average distance to workplace and the worst was the county with highest average road distance to workplace. $DTF = (\text{Worst} - A) / (\text{worst} - \text{frontier})$ $= (\text{Highest Average distance to workplace} - A) / (\text{highest Average distance to workplace} - \text{lowest Average distance to workplace})$

#### 5.1.2 Transport affordability

This is measured using the average costs of public transport to the workplace for the majority of citizens within the County.

**Table 17: Computation of Transport Affordability Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Transport affordability-Average cost of transport to workplace</b>	The average distance to work place is given by the distance between the employee residences and the worksite.	Distance to frontier approach was used in computation of the index. In the computation of the transport affordability index, there is no standard benchmark for the worst or frontier, therefore for this computation, the frontier (lowest transport cost), was the county where an individual incurs the lowest cost of transport to workplace and the worst was the county with highest transport cost incurred by an individual to workplace. $DTF = (Worst-A)/(worst-frontier)$ $= (Highest trasport cost to workplace - A) / (highest transport cost to workplace - lowest transport cost to workplace)$

### 5.1.3 Permanent housing

This is measured by percentage of households by adequate (finished) housing material composite

**Table 18: Computation of Permanent Housing Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Housing quality percentage of households by adequate (finished) housing material composite</b>	The percentage of households with housing adequate finished materials	Distance to frontier approach was used in computation of the index. In the computation of permanent housing index, the country's aspiration is to have 100% housings fitted with adequate composite-finished materials. That forms the benchmark (frontier). The worst is where the county has 0% of households with housing adequate finished materials. DTF therefore is given as; $DTF = (Worst-A)/(worst-frontier)$ $= (o-A)/(o-100)$

### 5.1.4 Internet connectivity

Measured by:

- The percentage of households with internet connectivity within the County.
- The percentage of schools with ICT connectivity within the County.

**Table 19: Computation of Internet Connectivity Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Internet connectivity Ratio of households with internet connection</b>	The internet connectivity indicator was measured by assessing the ratio of households with internet connection and the county aspiration of 100% attainment of internet connectivity at households. The ratio was converted into percentage by multiplying the ratios by 100.	In the computation of internet connectivity index, the country's aspiration is to have 100% internet connection to households. This forms the benchmark (frontier). The worst is where the county has 0% of households with internet connection. DTF therefore is given as; $DTF = (Worst-A)/(worst-frontier)$ $= (o-A)/(o-100)$
<b>School ICT connectivity Percentage of ICT connectivity in schools</b>	The number of schools connected with ICT to support teaching and learning process out of the total primary schools in the county. The country's aspiration was to equip all public primary schools with appropriate ICT infrastructure.	In the computation of School ICT connectivity index, the country's aspiration is to have 100% ICT connectivity to schools. This forms the benchmark (frontier). The worst is where the county has 0% of schools with ICT connection. DTF therefore is given as; $DTF = (Worst-A)/(worst-frontier)$ $= (o-A)/(o-100)$

### 5.1.5 Mobile money subscription

Measured using the percentage of population subscribed to mobile money transfer platforms within the County.

**Table 20: Computation of Mobile Money Subscription Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Mobile Money subscription Percentage of population subscribed to mobile money transfer platform</b>	This pillar measures the percentage of population subscribed to mobile money transfer platform; the government has an aspiration to achieve a 100 per cent mobile money subscription. Counties were given a score of 1 if they had attained the 100 per cent aspiration.	In the computation of Mobile Money Subscription index, the country's aspiration is to have 100% mobile money subscription. This forms the benchmark (frontier). The worst is where the county has 0% of population with mobile money subscription. DTF therefore is given as; $DTF = (Worst-A)/(worst-frontier)$ $= (0-A)/(0-100)$

### 5.1.6 Access to Electricity

Measured to establish the number of households with access to electricity within the County.

**Table 21: Computation of Access to Electricity Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Access to electricity</b>	Percentage of Conventional Households with mains electricity for lighting	In the computation of access to electricity index, the country's aspiration is to have 100% access. This forms the benchmark (frontier). The worst is where the county has 0% of population with electricity access. DTF therefore is given as; $DTF = (Worst-A)/(worst-frontier)$ $= (0-A)/(0-100)$

## 5.2 Relevance of Selected Indicators

Access to work as an indicator measured the distance covered to workplaces, using the distance to frontier benchmark. Access to work shows the significance of essential infrastructure in facilitating economic growth and access to public goods and services. Transport affordability entails the average transport costs using distance to frontier framework. Affordability of public transport indicate increased capacity of citizens to access public goods and services offered by the County government. Housing quality indicator was chosen to ascertain the County housing quality against the national 100 per cent goal. The internet connectivity indicator was chosen to gauge ease of access to information. It further enables the efficient delivery of public goods and services. School ICT connectivity was chosen to gauge the capacity and capability of County Governments to use modern technology to promote education. This was also critical to measuring the performance of Counties against the national target of 100% ICT connectivity. Mobile money subscription indicator is critical to understanding the efficient and transparent payment platforms put in place to enable access and delivery of services to citizens. Access to electricity indicator was chosen given that electric power remains one of the major drivers of economic growth in Kenya. Electricity enables the operation of offices, markets, industries, schools, hospitals and entertainment joints.



### **5.3 Test Results of Essential Infrastructure Indicators**

To test the reliability of essential infrastructure indicators, Cronbach's Alpha and PCA were carried out independently. The indicators tested included: the average distance to workplace, the average cost of transport to workplace, the percentage of households by housing material Composite-Finished materials(adequate), the percentage of households with internet connectivity, the percentage of ICT connectivity in schools and the percentage of population subscribed to mobile money transfer platform. Cronbach's Alpha produced a scale reliability coefficient of 0.82 with an average interitem covariance of 106.85. This indicates strong reliability. Similarly, PCA test on the reliability of the essential infrastructure indicators, the results show the first two (2) components out of the six (6) components, have eigenvalues greater than 1. These two components explain 74.17 per cent of the variations in the data. The first principal component analysis has large positive associations with the percentage of conventional households with mains electricity for lighting, percentage of population subscribed to mobile money transfer platform, and percentage of households by housing material composite-Finished materials(adequate). While for the second component, the largest positive contributions are from average distance to workplace and percentage of conventional Households with mains electricity for lighting. The percentage of ICT connectivity in schools' contributed the lowest scores in the pillar. The indicator on average cost of transport to workplace was dropped to make the model reliable.

## 6. ENVIRONMENT MANAGEMENT

Environment management “include, the protection, conservation and sustainable use of the various elements or components of the environment” (Environmental Management and Coordination Act, 1999). The sub-pillars for this pillar were clean energy use, forest management measured by forest management regulatory framework, forest management best practices; climate change management measured by climate change regulatory framework, climate change best practices, and solid waste management measured by solid waste regulatory framework and solid waste best practices. The index for the pillar was computed by averaging the scores of the sub-pillars using the formulae below;

$$\text{Environmental management} = (\text{Clean Energy Use} + \text{Forest Management} + \text{Climate Change Management} + \text{Solid Waste Management})/4$$

### 6.1 Key indicators of environmental management

#### 6.1.1 Clean energy use

This is measured using the percentage of households using clean energy within the County.

**Table 22: Computation of Clean Energy Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Percentage of household using Clean energy</b>	This indicator measures percentage of household with access to clean cooking energy	<p>The use of clean energy index score is arrived using the Distance to Frontier approach as follows:</p> $DTF = (Worst-A)/(worst-frontier)$ $=(0-A)/(0-100)$ <p>Where the worst is where the percentage of household using clean energy is 0%, and the frontier is a 100% (benchmark – where all the households are using clean energy). That is, as the county advocates for the use of clean energy and the number of households using it increases, then the county score tend to improve.</p>

#### 6.1.2 Forest management Regulatory framework

Measured by establishing the existence of county specific forest management policies, acts and guidelines within the County.

**Table 23: Computation of forest management index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Forest management regulatory and institutional frameworks index</b>	This indicator measures presence of policies and legislations that guide forest management, a score of 1 was for counties in place having regulatory and institutional framework. (5 is the maximum score you can get)	<p>The maximum counts of 5 scores becomes the highest as well as the frontier, while the least score is 0 Distance to Frontier approach was used as follows to compute the index</p> $DTF = (Worst-A)/(worst-frontier)$ $= (0-B)/(0-5)$

### 6.1.3 Forest Management best practices

Measured by establishing the Forest management best practice by county governments.

**Table 24: Computation of forest management best practices index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Forest management best practices</b>	Counties were scored on whether they had in place forest best practices including incorporating Forest Management in CIDP, promoting Private Forest Establishment, collaborations with stakeholders in forestry management Counties awarded a score of 1 if they have in place, 0 if not,  If Country x has a framework, i.e., Yes = 1, & if No = 0.	The maximum counts of 5 becomes the frontier, while the least score is 0  $DTF = (Worst-A)/(worst-frontier)$  $= (0-B)/(0-5)$

### 6.1.4 Climate change regulatory framework

Measured using the existence of county specific climate change policies, acts and guidelines.

**Table 25: Computation of climate change regulatory framework index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Climate change regulatory and institutional framework index</b>	Counties were scored on whether they had in place climate change regulatory framework which included climate change policy, climate change act, climate change strategic plan Climate change action plan, budget for climate change, climate change department, Climate change action plan, Climate and change finance mechanism Counties awarded a score of 1 if they have in place, 0 if not,  If Country x has a framework, i.e., Yes = 1, & if No = 0.	To derive the climate change regulatory and institutional framework index, distance to frontier approach was used as follows: $DTF = (Worst-A)/(worst-frontier)$  $= (0-B)/(0-7)$  The maximum counts of 7 becomes the frontier, while the least score is 0

### 6.1.5 Climate change best practices

Measured using the Climate change best practices by county governments (having experts, incentives systems, capacity building households on climate resilience and mainstreaming in CIPDs).

**Table 26: Computation of climate change best practices index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Climate change best practices</b>	This indicator measures application of climate change best practices, score of 1 was given to counties for having regulatory and institutional framework.	To derive the climate change best practices, distance to frontier approach was used as follows: $DTF = (Worst-A)/(worst-frontier)$  The maximum counts of 10 becomes the frontier, while the least score is 0 $= (0-B)/(0-10)$

### 6.1.6 Solid Waste Regulatory Framework

Measured by establishing the existence of county specific solid waste management policies, acts and regulations.

**Table 27: Computation of solid waste regulatory framework index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Solid waste management regulatory and institutional frameworks Index</b>	Counties were scored on whether they had in place solid waste management regulatory which included solid waste management policy, solid waste management act, solid waste Management Guidelines and Budget for solid waste Management Counties awarded a score of 1 if they have in place, 0 if not,  If Country x has a framework, i.e., Yes = 1, & if No = 0.	To derive the solid waste management regulatory and institutional framework Index frontier approach was used as follows: $DTF = (Worst-A)/(worst-frontier)$  The maximum counts of 4 becomes the frontier, while the least score is 0 $= (0-B)/(0-4)$

### 6.1.7 Solid waste best practices

Measured suing the solid waste management, best practices (collaboration with stakeholders, information management system, creating awareness, PPP, recycling and recovery, collection and sorting, composting sites, engaging public in cleaning).

**Table 28: Computation of solid waste best practices index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Solid waste management best practices</b>	Counties were scored on whether they applying solid waste management best practices which included solid waste information management systems, private partnership programmes for waste management encouraging solid waste recycling and waste material recovery Counties awarded a score of 1 if they have in place, 0 if not,  If Country x has a framework, i.e., Yes = 1, & if No = 0.	To derive the solid waste management best practices, distance to frontier approach was used as follows: $DTF = (Worst-A)/(worst-frontier)$  The maximum counts of 17 becomes the frontier, while the least score is 0 $= (0-B)/(0-17)$

## 6.2 Relevance of Selected Indicators

Clean energy use was chosen to gauge the number of people with access to safe, affordable clean energy against the 100% national target. Forest management institutional frameworks was chosen to gauge the legal and regulatory policy framework available at the County Governments to enable the management of forests. Forest management best practices was chosen to gauge the County-led capacity building of citizens on forest management. Climate change regulatory framework was chosen to establish the development of key legal and policy frameworks for mitigating against climate change at the County level. Climate change best practices indicator was chosen to gauge County-led capacity building on climate change best practices among its citizens. Solid waste management regulatory and institutional frameworks was chosen to gauge the presence of legal and policy structures to address solid waste management within the County. Solid waste indicator was chosen to establish County-led solid waste practices in which citizens are involved.

### **6.3 Reliability Test Results for Environment Management Indicators**

To test the reliability of the indicators used in the environment management pillar, PAI used Cronbach's Alpha and PCA to independently. The indicators selected were: the percentage of households using clean energy, the existence of county specific forest management policies, acts and guidelines, the existence of county specific climate change policies, acts and guidelines and the existence of county specific solid waste management policies, acts and regulations. The Cronbach's Alpha produced a scale reliability coefficient of 0.18 and an average interitem covariance of 0.00. The alpha coefficient produced was below 0.5 thus indicating the need for inclusion of more indicators. Using the PCA, the results show the first two (2) components out of the four (4) components, have eigenvalues greater than 1. These two components explain 58.63 per cent of the variations in the data. In the results, the first principal component analysis has large positive association with solid waste management regulatory and institutional frameworks indicator and proportion of household using clean energy. For the second principal component, the larger negative proportion is associated with climate change regulatory and institutional framework and largely positively associated with forest management regulatory and institutional frameworks. Evident by the 58.63 per cent of the variations in the model explained by the two components, and the alpha of below 0.6, additional data ought to have been included in the model for computation of a reliable index.

## 7. CRIME AND JUSTICE

Article 19 (1 &2) of the constitution of Kenya establishes the bill of rights as an integral to the democratic state. The bill of rights is therefore critical to the protection of individual and collective human rights, fundamental freedoms, dignity, and social justice for all Kenyans. The bill of rights as established in the Kenya constitution therefore provides a framework for fighting crime by outline the rule of law in citizen-state relations. The indicators measured in crime and justice include; prevalence of all offences and prevalence of gender-based violence crimes. The index for the pillar was computed by averaging the scores of the two indicators.

### 7.1 Key Indicators on crime and justice

#### 7.1.1 Prevalence of all offences

Measured using all offences crime rate per 100,000 population in the County.

**Table 29: Computation of prevalence of other crimes index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Crime incidences Total all offences per 100,000 (average 2016-2021)</b>	<p>The offenses in this case included all the conducts, acts or behaviors prohibited by law and punishable under the criminal law.</p> <p>The indicator was computed by dividing the actual number of total all offenses (excluding GBV Crimes) divided total county population then multiplied by 100,000.</p>	<p>To derive the total all offenses per 100,000 score, distance to frontier approach was used as follows:</p> $DTF = (Worst-A)/(worst-frontier)$ $= (worst performer-A)/(worst performer-o)$ <p>The worst cases was represented by the county with the largest number of total all offenses per 100,000 given by a ratio of while the frontier or the benchmark was the zero Offences incidences.</p>

#### 7.1.2 Prevalence of Gender-based violence crimes

Measured using the Gender-based violence rate per 100,000 population.

**Table 30: Computation of non-prevalence of gender-based violence crimes index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>GBV Crime incidences per 100,000 (Average 2020 &amp; 2021)</b>	<p>The indicator was computed by dividing the actual GBV crime incidences by total county population then multiplied by 100,000 population</p> $= (GBV \text{ cases incidences}) / (Total \text{ county population}) \times 100,000$	<p>To derive the GBV crime incidences score, distance to frontier approach was used as follows:</p> $DTF = (Worst-A)/(worst-frontier)$ $= (worst performer-A)/(worst performer-o)$ <p>The worst cases was represented by the county with the largest number of GBV crime incidences per 100 population while the frontier or the benchmark was the zero GBV crime incidence rate.</p>

### 7.2 Relevance of Selected Indicators

Non-prevalence of crimes indicator was chosen to gauge Counties performance against the national target of 0% crime rate. The non-prevalence of GBV was also chosen to gauge County performance against national aspiration of 0% GBV crime rates.

### **7.3 Reliability Test Results for Crime and Justice Indicators**

To test the reliability of the crime and justice indicators, Cronbach's Alpha and PCA were applied independently. The indicators tested included the non-prevalence of other crimes and the non-prevalence of gender-based violence crimes. The Cronbach's Alpha produced a scale reliability coefficient of 0.81 with an average interitem covariance of 0.02. Thus indicating strong reliability. PCA was further applied to the same indicators. The results show the first component out of the two components, has eigenvalue greater than 1. This component explains 84.82 per cent of the variations in the data. In the results, the first principal component analysis has large positive association with both the GBV crime index and the index for all the offences. This imply the indicators contribute equally to the changes in the model.

## 8. TRANSPARENCY AND ACCOUNTABILITY

Transparency and accountability indicators in the Public Affairs Index were derived from chapter 6 of the constitution of Kenya. Article 73 of the constitution of Kenya views public office as a public trust on the individual officer responsible for safeguarding the resources allocated in trust for the citizens of Kenya. Chapter 6 on leadership and integrity therefore applies equally at national and county government levels. The indicators selected include; control of corruption and quality of public participation.

### 8.1 Key Indicators for transparency and accountability

#### 8.1.1 Control of corruption

Measured using:

- Corruption & Economic crime rate per 100,000 within the County.
- Existence of county specific public participation policies acts and regulations/ guidelines.
- Use of public participation best practices

The index for the pillar was computed by averaging the scores of the three indicators.

**Table 31: Computation of control of corruption index scores**

Broad Indicator	Indicators	Description of the indicator	Scoring of the indicators
Corruption	Number of Corruption and economic crime rate per 100,000	<p>The indicator was computed by dividing the Number of Corruption and economic crime divided by the county total population then multiplied by 100,000 population</p> $= (Number\ of\ Corruption\ and\ economic\ crime) / (Total\ county\ population) \times 100,000$	<p>To derive the number of corruption and economic crime rate per 100,000 score, distance to frontier approach was used as follows:</p> $DTF = (Worst-A) / (Worst-frontier)$ $= (worst\ performer-A) / (worst\ performer-o)$ <p>The worst cases was represented by the county with the largest number of corruption and economic crime per 100,000 while the frontier or the benchmark was the zero number of corruption and economic crime cases.</p>

#### 8.1.2 Quality of Public Participation

Measured by establishing public participation best practices (providing timely information, giving feedback to public on decisions made, involving public in the process, inclusion of all in public forums, facilitating public participation through budgeting, incorporating public views in decision making).



**Table 32: Computation of Quality of Public Participation Index Scores**

Broad Indicator	Indicators	Description of the indicator	Scoring of the indicators
<b>Public participation regulatory framework</b>	Public participation regulatory framework index	Counties awarded a score of 1 if they have in place public participation regulations including policies, acts and departments to guide the process of public participation, 0 if not,	To derive public participation regulatory framework index, distance to frontier approach was used as follows: $DTF = (Worst-A) / (worst-frontier)$ The maximum counts of 3 becomes the frontier, while the least score is 0 $= (o-B)/(o-3)$
<b>Public participation best practices</b>	Public participation best practices index	Counties awarded a score of 1 if they have in place public participation best practices which includes; Timely information to members of public for their participation in barazas and other decision-making forums, feedback to public on analysis alternatives and/ or decisions information obtained, working directly with the public during public participation forums, inclusivity in public participation, budgeting for public participation activities and uptake of public participation views raised by the public.	To derive public participation best practices index, distance to frontier approach was used as follows: $DTF = (Worst-A) / (worst-frontier)$ The maximum counts of 7 becomes the frontier, while the least score is 0 $= (o-B)/(o-7)$

## 8.2 Relevance of the Selected Indicators

Control of corruption indicator was chosen to gauge the capacity of Counties to put in place measures to protect public resources. Public participation best practices indicator was chosen to assess the effectiveness of County-led public participation initiatives. Public participation regulatory and institutional frameworks indicator was chosen to gauge the legal and policy structures put in place by County governments to entrench public participation in the processes of debate on public affairs.

## 8.3 Reliability Test Results for Transparency and Accountability

To test the reliability of transparency and accountability pillar, Cronbach's Alpha and PCA were applied independently on the following indicators; corruption & economic crime rate per 100,000, the existence of county specific public participation policies, acts and regulations/guidelines and public participation best practices (providing timely information, giving feedback to public on decisions made, inclusion of all in public forums, facilitating public participation through budgeting, incorporating public views in decision making). The Cronbach's Alpha produced a scale reliability coefficient of 0.81 with average interitem covariance of 0.02. This indicates strong reliability of the indicators chosen. On the other hand, the PCA results show the first component out of the three components, has eigenvalue greater than 1. This component explains 66.04 per cent of the variations in the data. In the results, the first principal component analysis has large positive association with public participation regulatory and institutional frameworks and the public participation index. This imply the indicators contribute equally to the changes in the model. The association with corruption and economic crime rate per 100,000 has a greater contribution in component two although the eigenvalue is slightly below 0.1. Therefore, all the indicators are significant for computation of the transparency and accountability index.

## 9. WATER SANITATION AND HYGIENE (WASH)

World Health Organisation (WHO) identified ‘safe drinking water, sanitation and hygiene’ as critical not only to good health but also to sustaining “livelihoods, school enrolment and attendance, human dignity” and human productivity within the community. WASH is enshrined in the Kenyan constitution. Article 43 of the constitution establishes the rights to:

1. Accessible to clean and safe water in adequate quantities
2. Adequate housing, and to reasonable standards of sanitation;

### 9.1 Key indicators on WASH

#### 9.1.1 Access to improved water

Access to improved water; improved access to safe, affordable drinking water lowers probability of spread of water borne diseases. This was measured using the percentage of households with access to improved water within the County.

**Table 33: Computation for the Access to Improved Water Index scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Access to improved water (%)</b>	Total number of households in the sample with access to an improved water source divided by total number of households in the sample.	<p>The access to improved water index score is arrived at by:</p> $DTF = (Worst-A) / (worst-frontier)$ $= (0-A) / (0-100)$ <p>Where the worst is when the percentage of household with access to improved water is 0%, and the frontier is a 100% (benchmark – where all the households have access to improve water). That is, as the county seeks to enhance access to improved water source, the county score tend to improve.</p>

Access to improved sanitation; this enables the prevention of diseases. Measured using the percentage of households with access to improved sanitation within the County.

**Table 34: Computation of Access to Improved Sanitation Index Scores**

Indicators	Calculation of the indicator percentages	Scoring of the indicators
<b>Access to improved sanitation (%)</b>	Total number of households in the sample with access to any facility listed as improved sanitation source divided by the total number of households in the sample during the study period.	<p>The access to improved sanitation index score is arrived at by:</p> $DTF = (Worst-A) / (worst-frontier)$ $= (0-A) / (0-100)$ <p>Where the worst is when the percentage of household with access to improved sanitation is 0%, and the frontier is a 100% (benchmark – where all the households have access to improve sanitation). That is, as the county seeks to expand access to improved sanitation, the county score tend to improve.</p>

## **9.2 Relevance of the Indicators Selected**

Access to improved sanitation indicator was chosen to gauge the performance of County Governments on provision of improved sanitation against the national aspiration of 100 per cent access. Access to improved water sources indicator was chosen to assess the performance of County Governments against the national aspiration of 100 per cent.

## **9.3 Reliability Test Results for WASH**

The key indicators included in the computation of the WASH index comprised of the access to improved sanitation and access to improved sources of water. The findings shows that Kiambu and Kajiado have the highest scores implying that households in these counties have access to improved water and sanitation a reflection of deliberate efforts towards water availability, accessibility, and affordability. On the other hand, Wajir, Bomet and West Pokot have attained least scores which is attributed to low performance in the other sectors of WASH. On average, access to improved to sanitation scored an average score of 0.59 while access to improved water scored an average score 0.62.

## 10. SOCIAL WELFARE

The government of Kenya defines social welfare (protection) to include policies and legislations that:

- i) Enhance the capacity and opportunities for the poor and vulnerable to improve and sustain their livelihoods and welfare.
- ii) Enable income-earners and their dependants to maintain a reasonable level of income through decent work.
- iii) Ensure access to affordable health care, social security and social assistance.

The sub-pillars under this pillar include

- Poverty measured by non-food poverty, and non-multidimensional poverty,
- Health sector budgeting measured by health budget execution, attainment of Abuja declaration, pre-devolution Health Budget target
- Social sector budget execution measured by ECDE Budget Execution and social welfare budget execution
- Female empowerment measured female labour participation and female literacy.

The index for the pillar was measured by averaging the scores of the sub-pillars as shown in the formulae below:

$$\text{Social welfare} = (\text{Poverty} + \text{Health Sector Budgeting} + \text{social sector budget execution} + \text{Female Empowerment}) / 4$$

### 10.1 Key indicators for effective social welfare systems

#### 10.1.1 Food Poverty

Measured by establishing the percentage of households non-food poor households in the County.

**Table 35: Computation of Food Poverty Index Scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Non-Food poverty incidences (%)</b>	Measures the percentage of households who are unable to acquire or consume an adequate or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so. The country's aspiration is to reduce food poverty incidences to zero.	<p>Use of Distance to frontier (DTF)</p> $\text{score} = (\text{Worst}-A) / (\text{worst}-\text{frontier})$ $= (100-A) / (100-0)$ <p>Where, 100 is the worst, A is the unit of the indicator (status of food poverty incidence), and the frontier is 0 (benchmark – that is, the number of households reporting food poverty is zero). That is, as the county aims to achieve 0 food poverty incidence, it gets more scores.</p>

#### 10.1.2 Multidimensional Poverty

Measured by establishing the percentage of non-multidimensionally poor households in the County.

**Table 36: Computation of multidimensional poverty index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Multidimensional Poverty incidences (%)</b>	Multidimensional Poverty comprises the various deprivations experienced by poor people in their daily lives such as poor health (especially child health, nutrition), lack of education, and inadequate living standards. The country's aspiration is to reduce multidimensional poverty incidences to zero.	Use of Distance to frontier (DTF) $\text{score} = (\text{Worst}-A) / (\text{worst-frontier})$ $= (100-A) / (100-0)$ <p>Where, 100 is the worst, A is the unit of the indicator (status of multidimensional poverty incidence), and the frontier is 0 (benchmark – that is, the number of households reporting multidimensional poverty is zero). That is, as the county aims to achieve 0% multidimensional poverty incidence, it gets more scores.</p>

### 10.1.3 Health sector budgeting

- Measured using the health budget absorption rate for the last 2 financial years 2019/20-2020/21).
- Measured using the actual health sector budget allocation vs Abuja declaration health budget allocation (15%).
- Measured using the actual health sector budget allocation vs pre-devolution health sector budget allocation (35%).

**Table 37: Computation of Health sector budgeting index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Health budget Execution for the last 2 financial years (%)</b>	It is derived from the share of health budget expenditures (health budget utilized) divided by the total health budget released by the exchequer. $= (\text{Total health budget utilized}) / (\text{Total health budget from the exchequer}) \times 100$	Health budget execution index is derived using the DTF approach. $\text{score} = (\text{Worst}-A) / (\text{worst-frontier})$ $= (0-A) / (0-100)$ <p>Where the worst is when the share of health budget execution rate is 0%, and the frontier is a 100% (benchmark – where the budget meant for health is fully utilized (100%).</p>

### 10.1.4 Attainment of Abuja declaration

Measured on the aspiration of countries to allocate at least 15% of their annual budget to improve the health sector as per the Abuja declaration.

**Table 38: Computation of Attainment of Abuja declaration index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Percentage of health budget to total budget (last 2 financial years)</b>	It is derived as the share of total health budget to the county's health budget (%). $= (\text{Total health budget}) / (\text{Total county's budget}) \times 100$ <p>The country's aspiration is the attainment of Abuja declaration of 15% in the share of health budget to country's health budget.</p>	Attainment of Abuja Declaration health budget allocation index is derived using the DTF approach. $\text{score} = (\text{Worst}-A) / (\text{worst-frontier})$ $= (0-A) / (0-15)$ <p>Where the worst is when the share of total health to the county's budget is 0%, and the frontier is 15% (benchmark – where the share of total health budget to the county's budget is equal to or above the Abuja declaration of 15% (100%).</p>

### 10.1.5 Pre-devolution Health budget target

Measured Pre-devolution health budget benchmark of 35 per cent at the County level.

**Table 39: Computation of Pre-devolution Health budget target index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Pre-devolution Health budget allocation of 35%</b>	<p>It is derived as the share of total health budget to the county's health budget (%).</p> $= (Total\ health\ budget\ allocation) / (Total\ county's\ budget) \times 100$ <p>The country's aspiration is the attainment of pre-devolution health budget allocation of 35% in the share of health budget to country's budget.</p>	<p>Pre-devolution Health budget allocation index is derived using the DTF approach.</p> $score = (Worst-A) / (worst-frontier)$ $= (0-A) / (0-35)$ <p>Where the worst is when the share of total pre-devolution health budget allocation to the county's budget is 0%, and the frontier is a 35% (benchmark – where the share of total health budget allocation to the county's budget is equal to or above 35%.</p>

### 10.1.6 ECDE Budget Execution

- Measured percentage of Early Childhood Development (ECD) budget execution for the last 2 financial years
- Measured using the ECDE Budget absorption rate in last 2 financial years 2019/20-2020/21.

**Table 40: Computation of ECDE Budget execution index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>ECDE Budget execution (last 2 financial years) (%)</b>	<p>It is derived as the share total ECDE budget expenditure relative to the total ECDE budget (exchequer releases).</p> $= (Total\ ECDE\ budget\ spending) / (Total\ county's\ ECDE\ budget) \times 100$	<p>ECDE budget execution index is derived using the DTF approach.</p> $score = (Worst-A) / (worst-frontier)$ $= (0-A) / (0-100)$ <p>Where the worst is when the share of ECDE budget to the county's ECDE budget execution is 0%, and the frontier is a 100% (benchmark – where the share of ECDE budget spent to the county's ECDE budget is 100%.</p>

### 10.1.7 Social sector budget execution

Measured using the Social welfare budget absorption rate in last 2 years 2019/20-2020/21.

**Table 41: Computation of social sector budget execution index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>social welfare budget execution (last 2 years) (%)</b>	<p>It is derived as the share total social welfare expenditures relative to the total social welfare budget allocation (exchequer releases).</p> $= (Total\ social\ welfare\ budget\ spending) / (Total\ county's\ Social\ welfare\ budget) \times 100$	<p>Social welfare budget execution index is derived using the DTF approach.</p> $score = (Worst-A) / (worst-frontier)$ $= (0-A) / (0-100)$ <p>Where the worst is when the share of social welfare budget execution to the county's budget is 0%, and the frontier is a 100% (benchmark – where the share of social welfare budget execution is 100%.</p>

### 10.1.8 Female literacy

Measured percentage of female literacy rate at the County level.

**Table 42: Computation of female literacy index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Female literacy rates</b>	This indicator measures percentage of female in the population aged 15 years and over who can both read and write with understanding a short simple statement on his/her everyday life.	Female literacy rates is derived using the DTF approach $\text{score} = (\text{Worst}-A) / (\text{worst-frontier})$ $= (0-A) / (0-100)$ Where the worst is when there is 0% literacy rates, and the frontier is a 100% (benchmark – where literacy rates are 100%.

### 10.1.9 Female labour participation

Measures percentage of female labour participation at the County level.

**Table 43: Computation of Female labour participation index scores**

Indicators	Description of the indicator	Scoring of the indicators
<b>Female labour participation</b>	This indicator measures percentage of females in working age population in the county that are in the labour force. Therefore, labour participation rate is given by: $= (\text{Total female Labour force (15-65+)}) / (\text{Total females working age population}) \times 100$ Labour participation rate is then transformed into an index	Female labour participation is derived using the DTF approach To $\text{score} = (\text{Worst}-A) / (\text{worst-frontier})$ $= (0-A) / (0-100)$ Where the worst is when there is 0% labour participation, and the frontier is a 100% (benchmark – where labour participation are 100%.

## 10.2 Relevance of the Selected Indicators

Food poverty indicator was chosen to measure availability of food and the individual's ability to access it. The County's performance was measured against the national aspiration of 0% food poverty incidences. Multidimensional poverty indicator was chosen to measure various deprivations experienced by poor people (malnutrition, lack of education and inadequate living standards) against the national aspiration of 0 per cent multi-dimensional poverty incidences. Health budget execution was chosen to gauge County Health Budget execution against the national target of 100 per cent health budget execution. 100% Health Budget execution enables the provision of key health services that ultimately promote wellbeing. Attainment of Abuja declaration indicator of at least 15 per cent annual budget allocation to promotion of health within African states was gauged against County budget allocations on health annually to ascertain County investment on health programmes. Pre-devolution health budget target indicator with a benchmark of 35 per cent allocation to healthcare was chosen to compare with the national pre-devolution target of 35 per cent national budget allocation to health programming. ECDE Budget Execution was chosen to gauge Counties performance against the national aspiration of 100 per cent ECDE Budget execution at the national levels. Social welfare budget execution indicator was chosen to gauge the performance of County Governments against the national aspiration of 100 per cent social welfare budget execution at the national level. Female labour participation was chosen to gauge the level of female workforce at the County level against the national aspiration of 100 per cent female labour participation. Female literacy rates were chosen to gauge the Counties performance against the national aspiration of 100 per cent female literacy.

### **10.3 Reliability Test Results for Social Welfare Indicators**

To test the reliability of social welfare indicators, PAI applied Cronbach's Alpha and PCA independently. The indicators selected were: the percentage of households in food poverty, the percentage of households in multidimensional poverty, the health budget absorption rate for the last 2 financial years 2019/20-2020/21, the actual health sector budget allocation vs Abuja declaration health budget allocation (15%), the actual health sector budget allocation vs pre-devolution health sector budget allocation (35%), the ECDE Budget absorption rate in last 2 financial years 2019/20-2020/21 and Social welfare budget absorption rate in last 2 years 2019/20-2020/21. The Cronbach's Alpha produced a scale reliability coefficient of 0.62 with an average interitem covariance of 0.00. Thus presenting fairly good reliability. Similarly, PCA was applied to the same indicators the results show the first three components out of the six components, have eigenvalue greater than 1. This component explains 83.04 per cent of the variations in the data. In the results, the first principal component analysis has large positive association with the Pre-Devolution Health budget target, attainment of Abuja Health declaration and food poverty index. The multi-dimensional indicator was dropped since it can be explained using the food poverty index. For component two, the larger positive association was from the food poverty index and female literacy, and adverse larger association from ECDE budget. This implies, at least all the selected indicators have significant contributions.



## 11. COMPUTATION OF THE OVERALL PUBLIC AFFAIRS INDEX

### How was the PAI finally computed?

#### a) *Fiscal Management*

The Indicators were computed using the Cronbach's Alpha. It measures internal consistency. It shows how closely related different items are within a group. The PAI indicator on fiscal management produced scale reliability coefficient of 0.65 with an average interitem covariance of 0.00. The number of items measured were 10. The Alpha coefficient of above 0.65 produced indicated good reliability, therefore all indicators were included in the computation.

#### b) *Economic Performance*

Cronbach's Alpha was also applied in computing indicators for economic performance. Six key indicators were measured; this included Average Real GCP Growth 2014-2017, Contribution of manufacturing to GCP 2013-2017, Labor participation rate (%), CBEM score 2022, Percentage of financial access and Reversed Gini coefficient. Scale reliability coefficient of 0.61 was established with an average interitem covariance of 0.00. The Alpha coefficient of above 0.5 indicate good reliability.

#### c) *Human Capital Development*

Computation for human capital development entailed the measurement of six indicators. These included; Percentage of skilled birth, Percentage of stunted children, Percentage of Children 12 -23 months fully vaccinated Adult literacy rates and Primary school net enrolment (%). Cronbach's computation produced a scale reliability coefficient of 0.83 with an average interitem covariance of 95.52. This resulted in alpha coefficient of above 0.65, thus reflecting strong and good reliability leading to the inclusion of all the indicators in the Public Affair Index.

#### d) *Essential Infrastructure*

Computation for essential infrastructure entailed the measurement of six indicators. These included; average distance to workplace, average cost of transport to workplace, percentage of households by housing material composite-finished materials(adequate), percentage of households with internet connectivity, percentage of ICT connectivity in schools and percentage of population subscribed to mobile money transfer platform. Cronbach's computation produced a scale reliability coefficient of 0.82 with an average interitem covariance of 106.85. This resulted in a strong coefficient of 0.82 indicating a strong reliability, thus the inclusion of all the indicators in the computation of the index.

#### e) *Environment management*

Computation of the environment management pillar entailed the measurement of four indicators as follows: percentage of households using clean energy, existence of county

specific forest management policies, acts and guidelines, existence of county specific climate change policies, acts and guidelines and existence of county specific solid waste management policies, acts and regulations. Cronbach's computation produced a scale reliability coefficient of 0.18 with an average interitem covariance of 0.00. This resulted in an alpha coefficient which is below 0.5 indicating insufficiency of data to predict the model, thus additional indicators need to be included.

***f) Transparency and Accountability***

Computation of the transparency and accountability pillar entailed the measurement of three indicators. These included; Corruption & Economic crime rate per 100,000, Existence of county specific public participation policies, acts and regulations/guidelines and Public participation best practices (providing timely information, giving feedback to public on decisions made, inclusion of all in public forums, facilitating public participation through budgeting, incorporating public views in decision making). Cronbach's computation produced a scale reliability coefficient of 0.63 with an average interitem covariance of 0.01. This resulted in an alpha coefficient above 0.5. Thus presenting fairly good reliability. Hence all indicators were included.

***g) Crime and Justice***

Computation of crime and justices indices entailed the measurement of two indicators. These were: All offences crime rate per 100,000 population and GBV Crime rate per 100,000 population. Cronbach's computation produced a scale reliability coefficient of 0.81 with an average interitem covariance of 0.02. This resulted into an alpha coefficient of above 0.5, thus indicating strong reliability.

***h) Water sanitation and hygiene***

Computation for WASH entailed the measurement of two indicators. These included access to improved water and access to improved sanitation. Cronbach's computation produced a scale reliability coefficient of 0.83 with an average interitem covariance of 95.52. This resulted in alpha coefficient of above 0.65, thus reflecting strong and good reliability leading to the inclusion of all the indicators in the Public Affairs Index.

***i) Social Welfare***

Computation of social welfare pillar included the measurement of the following six indicators: percentage of households in food poverty, percentage of households in multidimensional Poverty, health budget absorption rate for the last 2 financial years 2019/20-2020/21, actual health sector budget allocation vs Abuja declaration health budget allocation (15%), actual health sector budget allocation vs pre-devolution health sector budget allocation (35%), ECDE Budget absorption rate in last 2 financial years 2019/20-2020/21 and social welfare budget absorption rate in last 2 years 2019/20-2020/21. Cronbach's computation produced a scale reliability of coefficient of 0.6253 with an average interitem covariance of 0.00. This resulted in above 0.5 alpha coefficient which indicate good reliability.

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