



W&S Integrity Index Risk Index (WIRI)

Policy context and WIRI design

Government Transparency Institute & Water Integrity Network

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Outline



Government
Transparency
Institute



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Rationale and Index Design



Why a new index?

- ▶ Violations of integrity, fraud, and corruption result in reduced quality, affordability and availability of water and sanitation services.
- ▶ There is thus an urgent need to proactively and systematically identify, precisely and comprehensively measure, and effectively mitigate corruption risks in the sector.
- ▶ However, policy reform effectiveness and adequate policy targeting are difficult to gauge without valid and reliable measurement of corruption.
- ▶ The novelty of our approach comes from applying Big Data methods to administrative data and survey data sets in order to develop a comprehensive and actionable integrity risk indicator.

The Water and Sanitation Sector Integrity Risk Index



WIRI Description

We employ a data-driven approach to develop a composite Water Integrity Risk Index (WIRI) made up of a host of objective proxy indicators as well as survey-based measures of corruption experience to identify and assess integrity risks in the urban W&S sector in selected settlements around the world. Unlike broader scope corruption indices, the WIRI uses administrative data sets and survey data capturing information on corruptible transactions; thus, our analysis is micro-level, narrowly focuses on the W&S sector, and is both transparent and replicable.



Competition violations and Corruption Risks

The aim of institutionalised corruption is to steer the contract to the favoured bidder without detection in a recurrent and organised fashion.

Corruption in public procurement requires at least two violations of principles of fair distribution of public resources:

- ▶ avoiding competition, by for example using unjustified sole-sourcing or direct contract awards;
- ▶ favouring a particular bidder, by for instance tailoring specifications, or sharing inside information

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We identify three main pillars of integrity in the W&S sector:

1. Public investment projects (e.g. building new pipelines or drainage),
2. Recurrent spending supporting ongoing operations (e.g. paying salaries, purchasing computers), which is addressed as operations in this work; and
3. Client-utility interactions (e.g. paying utility bills).



Pillar I: Investment Integrity

Corrupt acts which influence contracts or bids result in fraud to over or underestimate assets; selection and type, award of concessions; decisions over duration, exclusivity, tariffs, subsidies, this impacts the quality of the work and the time it is completed. Additionally, fraud in invoicing may be present through marked-up pricing, and or overbilling by suppliers.

Corruption in investment projects in the W&S sector typically ends up happening through public procurement or government contracting. In public procurement, the aim of institutionalised corruption is to steer the contract to the favoured bidder without detection in a recurrent and organised fashion.

Pillar II: Operations Integrity



Once the utility is operating, integrity may be lacking throughout the maintenance of the service and the execution of its budget. This can manifest itself as administrative corruption in personnel management when presents and payments are made by candidates to receive appointment, promotion, or conserve strategic post (e.g. utility directorships).

For example, senior agency administrators may ask for a payment from professional and engineering staff in exchange for favourable reviews, promotions, and transfers. Additionally, inflated costs for the maintenance of the service relating to chemicals, vehicles or equipment are also present throughout the WS sector.

Pillar III: Interactions Integrity



Lack of integrity in the client-utility nexus can take a variety of forms with different effects such as unaccounted for water, unofficial usage of tankers, low reporting of faults, unexplained zonal variations, and ignored complaints from consumers and small scale providers.

Payments are made in exchange for several services, such as expediting applications for new connections; quick attention to water supply works and sewer repair work; the falsification of water bills; and ignoring illegal service connections. Industrial actors, with regards to connection of electricity and water after submitting applications, admit that bribes are required at every stage of the process.

“Each of the three pillars can be assessed using a host of tried corruption and integrity indicators based on both administrative and survey data sources, resulting in a robust and comprehensive measurement.”

Given that integrity is a latent variable, we must rely on proxy indicators which can, in conjunction, reveal integrity risks. We calculate the composite WIRI with the following steps:

1. We standardize each component indicator of integrity-risk so that they can be directly compared (higher values imply higher integrity).
2. Calculate the weight of each component indicator (5 in total, categorized into 3 pillars) by the amount of data points available for the timeseries in a global version of the WIRI. Fewer available data points in a component lead to a decrease its pillar weight on the index.
3. We calculate the weighted mean of each indicator to derive the composite WIRI score based on the data available.

Public procurement risk indicators

We assign each public procurement contract to one of the 3 pillars using product codes specific to the nature of W&S activity defined by public procurement data systems such as the Common Procurement Vocabulary (CPV) codes.

The public procurement risk indicator is a composite score of five elementary risk indicators:

- ▶ Decision Period
- ▶ Call for Tenders
- ▶ Advertisement Period
- ▶ Procedure Type
- ▶ Single Bidding

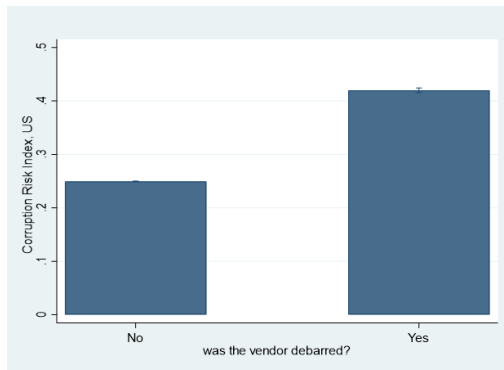
The composite score is scaled so that it falls between 0 and 100, with 100 representing the highest integrity and 0 representing the lowest integrity (lack of integrity).

Integrity Risk Indicators



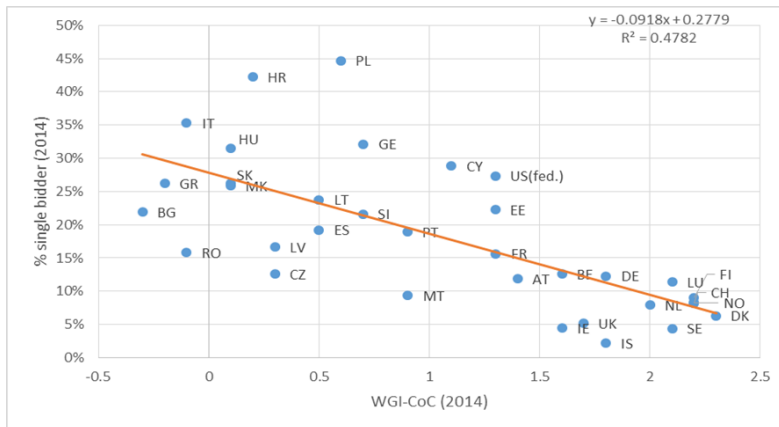
INDICATOR NAME	INDICATOR DEFINITION
<i>LENGTH OF DECISION PERIOD</i>	100=length of decision period is unrelated to corruption risks (single bidding) 0=length of decision period OR missing decision period is related to corruption risks (single bidding)
<i>PROCEDURE TYPE</i>	100=open 0=non-open (accelerated, restricted, award without publication, negotiated, tender without competition)
<i>SINGLE BIDDER CONTRACT</i>	100=more than 1 bid received 0=1 bid received
<i>CALL FOR TENDERS PUBLICATION</i>	100=call for tender published in official journal 0=NO call for tender published in official journal
<i>LENGTH OF ADVERTISEMENT PERIOD</i>	100=length of advertisement period is unrelated to corruption risks (single bidding) 0=length of advertisement period or missing advertisement period is related to corruption risks (single bidding)

Validity of Integrity Risk Indicators: Proven Cases



Debarred firms have significantly more red flags in their awarded contracts than the average. US federal procurement, 2004-2015, N=569706
Red flags include single bid tender, non-competitive solicitation, or lack of advertisement of tender

Validity of Integrity Risk Indicators: Cross-country Evidence



Single bidding rate correlates with perceptions-based corruption indicators such as WGI: Control of Corruption

Survey data indicators

We employ survey data to construct the indicator on bribery experiences in the W&S sector. For Kenya, we rely on the Afro-barometer, collecting positive responses from a representative sample of the population of settlements in the country who admit to bribing to obtain water services.

For each of the available survey, we calculate the rate of bribery by dividing the number of respondents who admitted bribery over the total number of respondents who required or requested a WS service in a settlement.

Given data availability limitations, the survey component of the WIRI index has the lowest weight (1.6%). It is important to note, however, that as survey data becomes more systematically available, the relative weight of this component could be scaled upwards in subsequent iterations.

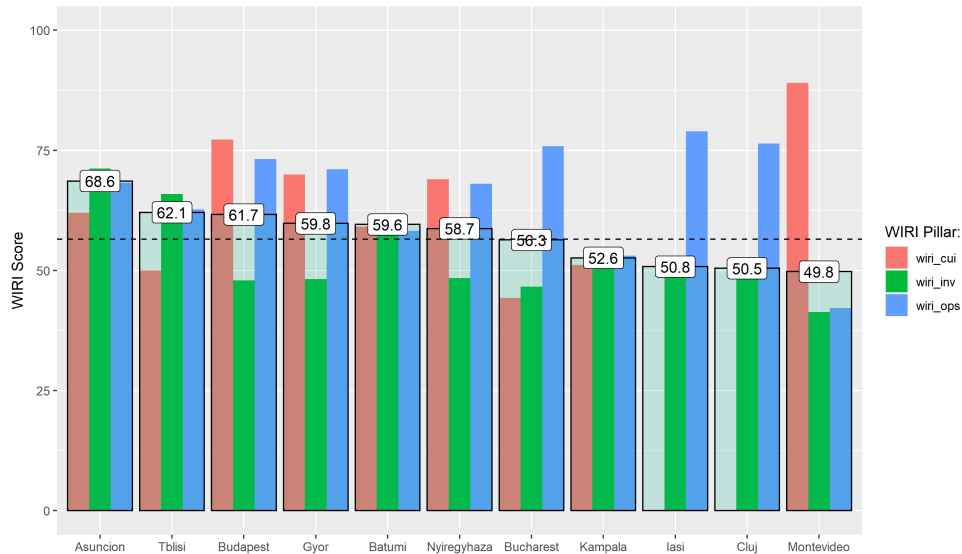


Implementing the WIRI



Cross-Sectional WIRI Pilot

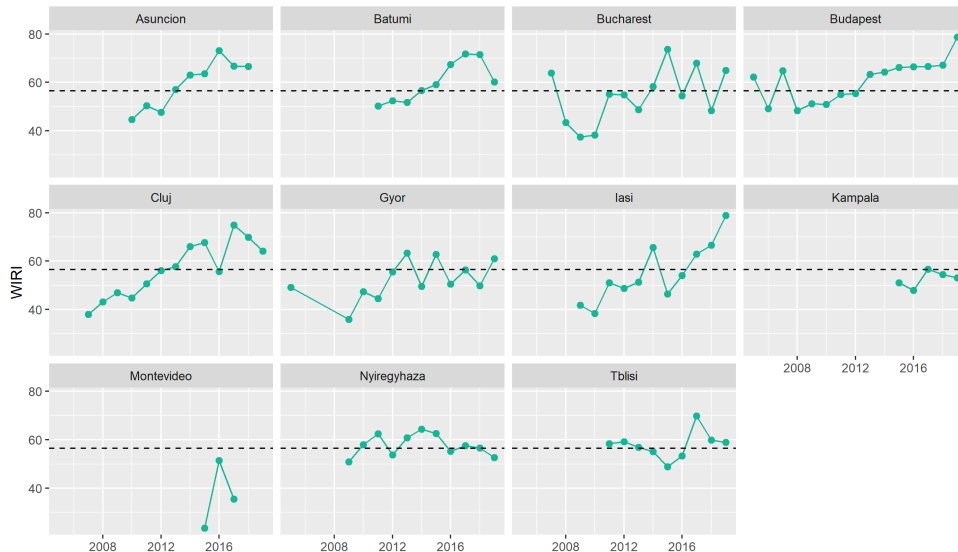
WIRI mean = 56.5





Time-Series WIRI Pilot

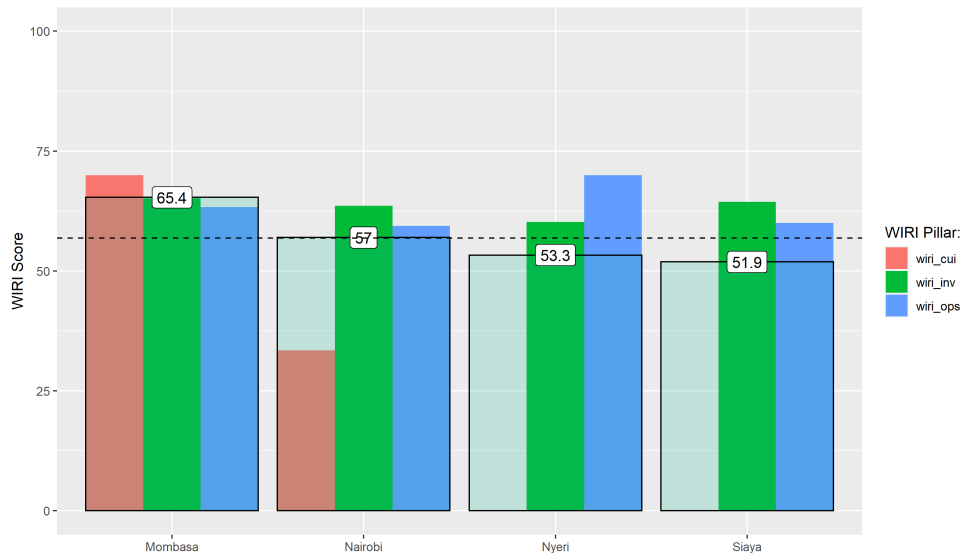
WIRI mean = 56.52



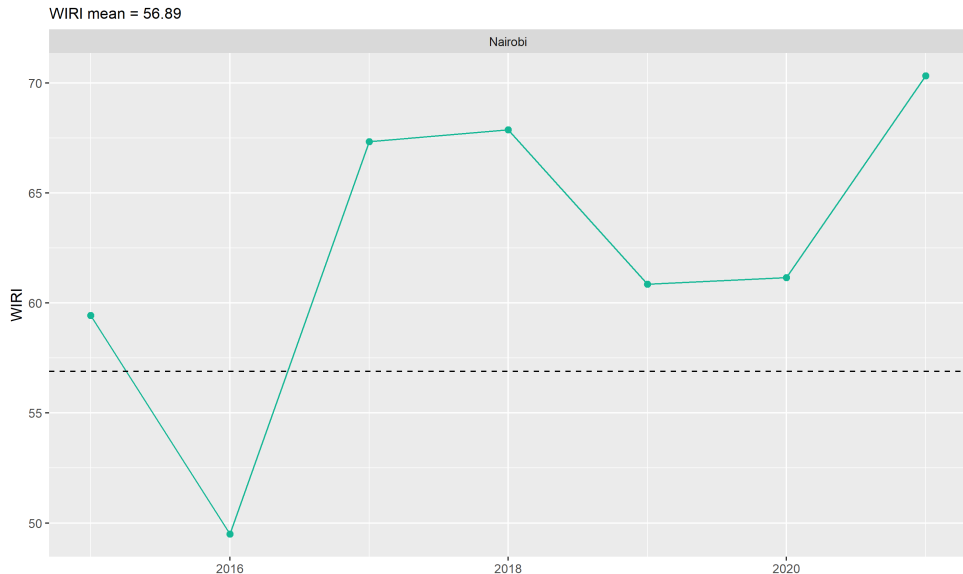


Cross-Sectional WIRI Kenya

WIRI mean = 56.9



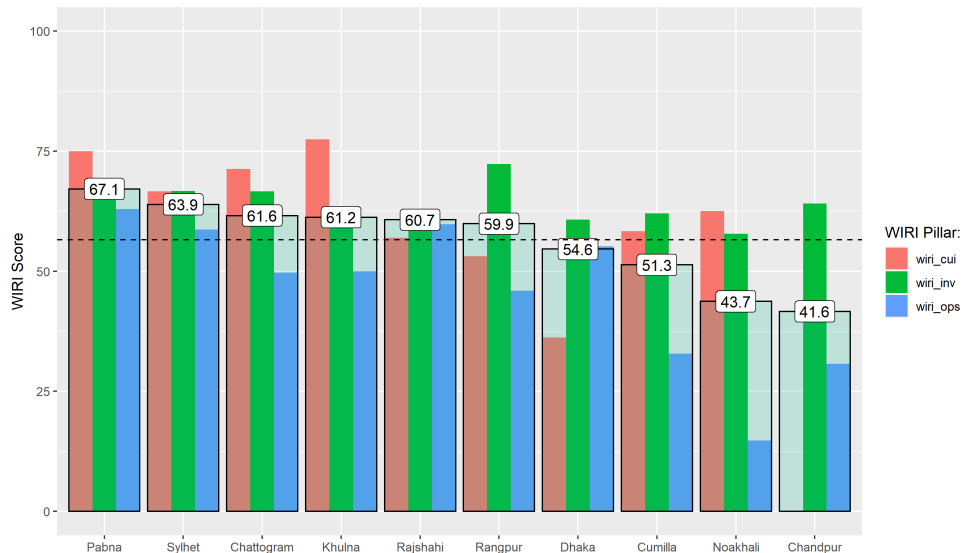
Time-Series WIRI Kenya





Cross-Sectional WIRI Bangladesh

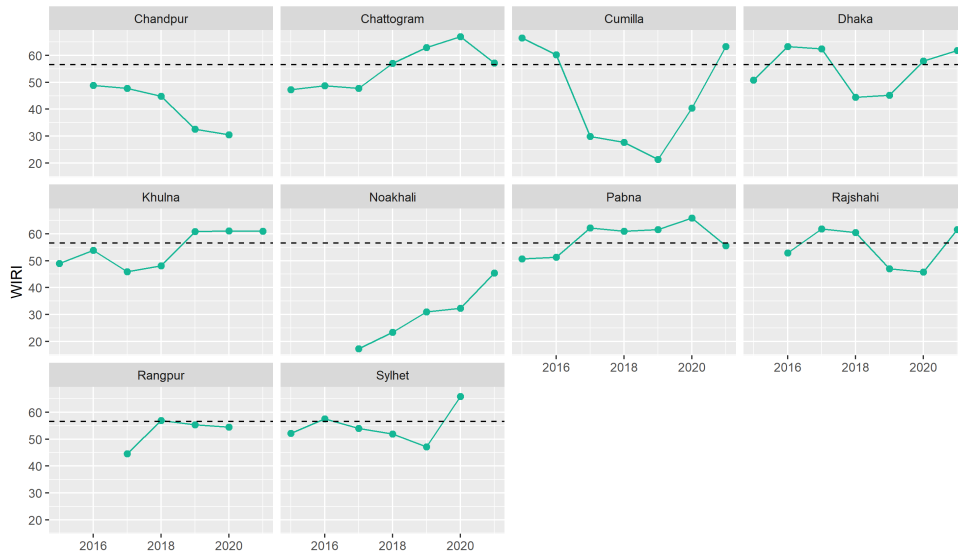
WIRI mean = 56.6





Time-Series WIRI Bangladesh

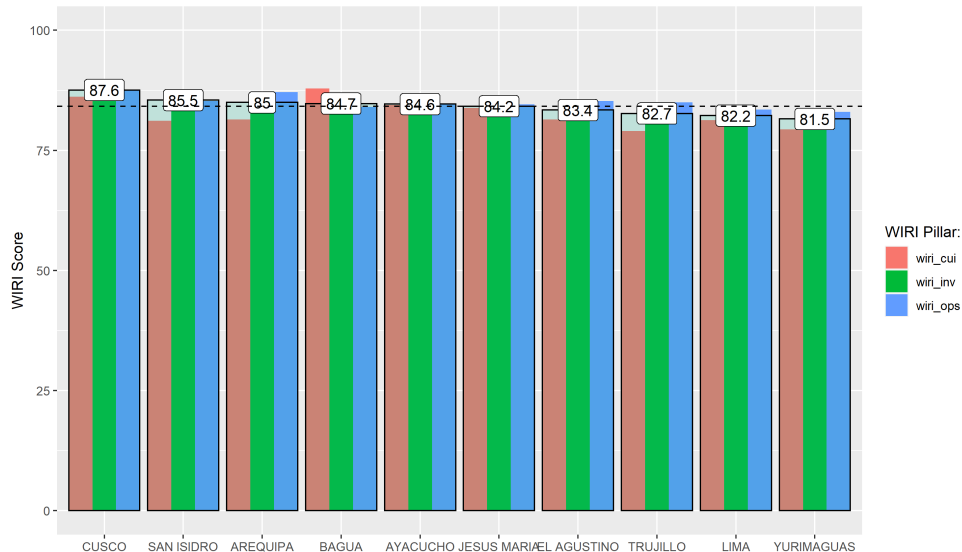
WIRI mean = 56.58





Cross-Sectional WIRI Peru

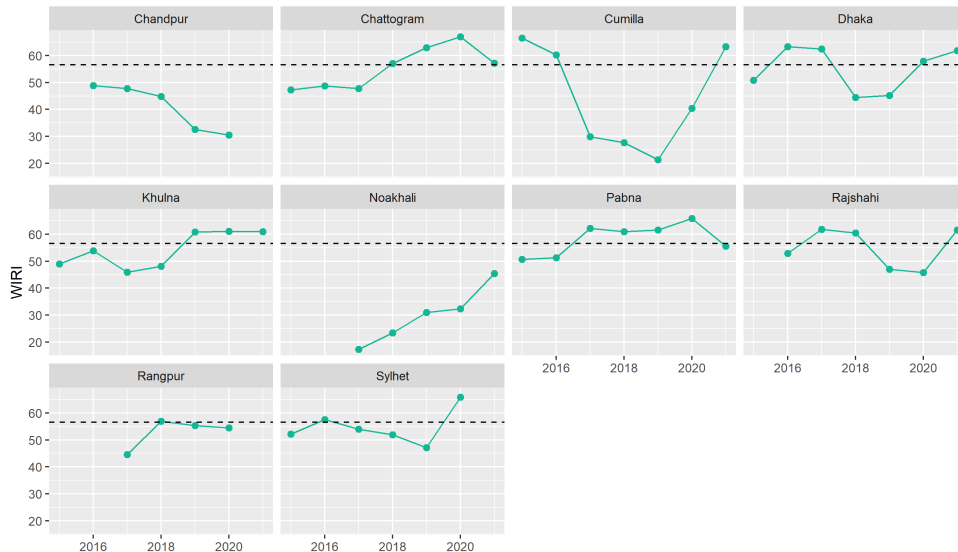
WIRI mean = 84.1





Time-Series WIRI Peru

WIRI mean = 56.58



WIRI Global Coverage



WIRI Country Coverage:

1. Peru
2. Bangladesh
3. Kenya
4. Hungary
5. Paraguay
6. Georgia
7. Romania
8. Uganda
9. Uruguay

WIRI Cities:

- ▶ Asuncion
- ▶ Tblisi
- ▶ Budapest
- ▶ Gyor
- ▶ Batumi
- ▶ Nyiregyhaza
- ▶ Bucharest
- ▶ Kampala
- ▶ Iasi
- ▶ Cluj Napoca
- ▶ Montevideo
- ▶ Mombasa
- ▶ Nairobi
- ▶ Nyeri
- ▶ Siaya
- ▶ Pabna
- ▶ Sylhet
- ▶ Chattogram
- ▶ Khulna
- ▶ Rajshahi
- ▶ Dhaka
- ▶ Cumilla
- ▶ Noakhali
- ▶ Chandpur
- ▶ Cusco
- ▶ San Isidro
- ▶ Arequipa
- ▶ Bagua
- ▶ Ayacucho
- ▶ Jesus Maria
- ▶ El Agustino
- ▶ Trujillo
- ▶ Lima
- ▶ Yurimaguas

WIRI Global Coverage





Policy Applications

Data-driven insights for anti-corruption

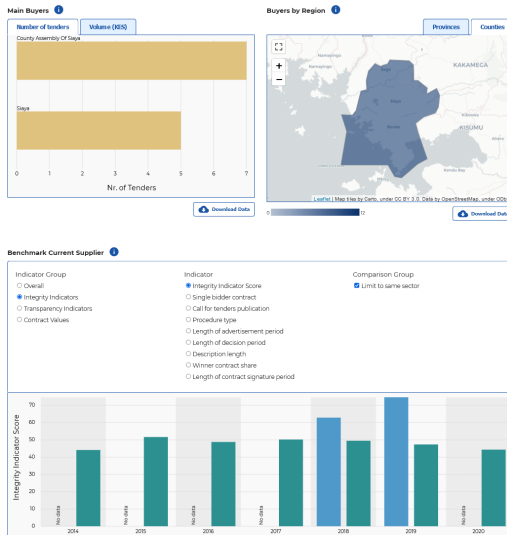
Supporting investigations and monitoring on the contract or organisation levels

- ▶ Initiation (e.g. flagging new cases to investigate)
- ▶ Selection (e.g. ranking known cases)
- ▶ Conduct (e.g. exploring selected cases)

Supporting policy reform and policy evaluation

- ▶ Systemic (e.g. data system)
- ▶ Regulatory (e.g. advertisement rules)
- ▶ Organisational (e.g. setting market entry targets)

Example of investigating a company: Kenya and a large construction firm



Example of policy impact evaluation: Romania and COVID-19 state of emergency

