W&S Integrity Index Risk Index (WIRI)

Tool Presentation

Government Transparency Institute & Water Integrity Network

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The Water and Sanitation Sector Integrity Risk Index

What is WIRI?

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.

WIRI Design

The Water Integrity Risk Index (WIRI) is 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 country. It ranges from 0 to 100 with higher values indicating higher levels of integrity (thus fewer corruption risks).

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).

Methodology

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.

Procurement Indicators

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
LENGTH OF DECISION PERIOD	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)
PROCEDURE TYPE	100=open 0=non-open (accelerated, restricted, award without publication, negotiated, tender without competition)
SINGLE BIDDER CONTRACT	100=more than 1 bid received 0=1 bid received
CALL FOR TENDERS PUBLICATION	100=call for tender published in official journal 0=NO call for tender published in official journal
LENGTH OF ADVERTISEMENT PERIOD	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)

Survey Indicators

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.

Interactive Tool

Interactive Dashboard:

- The interactive tool consists of an R Shiny App which will allow users to upload a CSV file with the necessary procurement and survey data in order to receive WIRI analytical outputs such as charts. This is designed to allow users with limited technical or programming knowledge to make the most of this innovative policy and measurement instrument.

Documentation:

- Both the manual and the tutorial video detail the process through which users may collect procurement data on water and sanitation contracts as well as survey data on direct experiences with corruption in the sector. Similarly, they will guide the users on how this data must be structured in order for the background calculations of the app to run properly.

Interactive Tool

Front End

The front end of the interactive dashboard will encompass the user interface of the WIRI methodology (R script), providing a visually appealing and user-friendly interface that displays relevant information and facilitates user interaction through intuitive controls and buttons.

- Example of Front end

Front End

The backend of the interactive dashboard will encompass the underlying infrastructure and functionality of the WIRI script, where data is stored, processed, and manipulated, user requests are handled, and WIRI analysis logic is implemented, providing a robust and efficient foundation that powers the front end user experience.

- Example of Back End

Dashboard

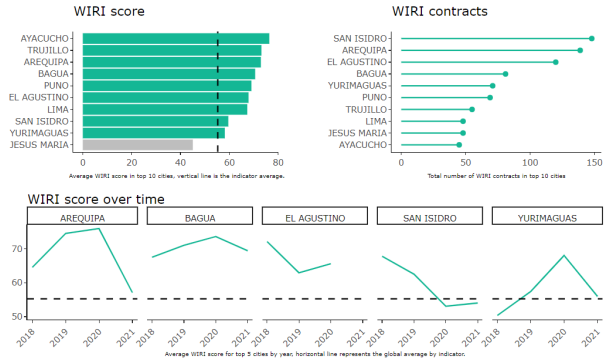
Water Integrity Risk Indicator Results

Averages (all years):

WIRI 55, Investments 53, Operations 44, Interactions 63

City	WIRI	Investments	Operations	Interactions
ABANCAY	76.91	79.33	66.82	81.67
ACOBAMBA	72.15	85.00	80.00	60.00
ACOS VINCHOS	50.49	70.00	0.00	70.00
AGUAS VERDES	42.58	53.75	0.00	62.06
ALCA	52.28	0.00	72.50	70.00
AMARILIS	75.14	73.89	68.33	80.00
AMBAR	44.22	0.00	60.00	60.00
ANANEA	60.66	62.50	60.00	60.00
ANCO	51.64	70.00	0.00	72.50
ANCO_HUALLO	53.76	65.00	0.00	80.00
ANDAHUAYLAS	72.41	75.00	76.67	68.33
ANDARAY	58.96	0.00	80.00	80.00
ANGASMARCA	50.49	70.00	0.00	70.00
AREQUIPA	72.91	71.67	71.04	74.76
ASCOPE	58.81	90.00	0.00	76.67

Select an indicator: WIRI

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[1] "Keyords used.  Interactions: agua+|acua+|hidr+ Operations: maquinaria+|equip+ Investments: construc+"
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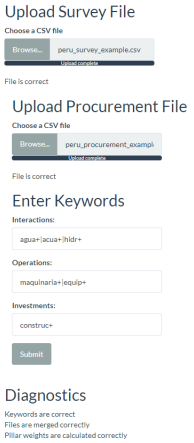
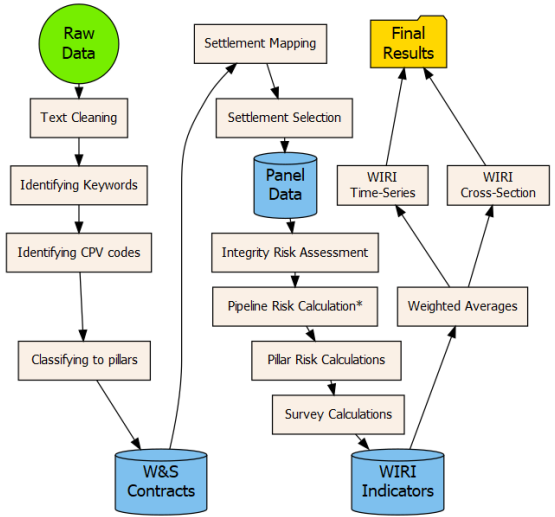
Control Panel



Back End


Raw Data
Text Cleaning
Identifying Keywords
Identifying CPV codes
Classifying to pillars
W&S Contracts
Settlement Mapping
Settlement Selection
Panel Data
Integrity Risk Assessment
Pipeline Risk Calculation*
Pillar Risk Calculations
Survey Calculations
WIRI Indicators
Weighted Averages
WIRI Time-Series
WIRI Cross-Section
Final Results

User Test

Thank you for expressing your interest and dedicating your time to help us test the WIRI WIN app. Your role in this endeavor is pivotal: we're relying on your invaluable insights to test each step of the tool and subsequently share feedback regarding the process.

After this briefing, we will circulate a concise questionnaire through Google Forms to gather your feedback. Your insights are vital to us, and we kindly request you share your thoughts by October 21st.

Please take a look at the tool at your own pace. At midnight, we will upload a draft version of the user manual with useful links on how to construct your own data sets.

Once again, sincere thanks from GTI and WIN!