



### Evans School Policy Analysis and Research (EPAR)

#### Process Documentation:

Summary of International Financial Institution (IFI)  
Investments in Sub-Saharan Africa 2021

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EPAR Project #411

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#### Executive Summary

This document describes the process of designing an Excel spreadsheet that describes point-in-time (late January 2021) International Financial Institution (IFI) investments in 46 Sub-Saharan African countries and compares them to other relevant country-level indicators. This spreadsheet project was undertaken for the Agricultural Development team at the Gates Foundation, to assess current agricultural loans and investments for potential alignment with their Transferring Innovations body of work.

#### Process Overview

We performed the following steps to download, clean, and analyze project information from three IFIs (the World Bank, African Development Bank, and the International Fund for Agricultural Development), in addition to demographic and supplemental funding data from the World Bank World Development Indicators, OECD Creditor Reporting System, and the Regional Strategic Analysis and Knowledge Support System (ReSAKKS) databases for comparison:

1. Access *project data* and *supporting data* from source webpages
2. Download data, or webscrape using R/Python scripts, into CSV format
3. Import *project data* into the #411 IFI Excel workbook and format for analysis
4. Clean and combine *project data* and *supporting data* and create new indicators in Stata
5. Re-export cleaned, country-level data into the #411 IFI Excel workbook
6. Analyze and interpret findings in the #411 IFI Excel workbook using Excel pivot charts and formulas

See Appendix A for a flowchart visualizing the steps outlined above.

#### Data Sources

**IFI Sources:** This project centered on most recent International Financial Institution (IFI) investments in Sub-Saharan African countries. IFIs are not a strictly-defined category; generally, they are characterized as a multilateral fund or bank with high credit ratings and a broad membership of borrowing and donor countries. They provide loans, credits, or grants to national governments and also, occasionally, sub-national government

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entities and the private sector. The IFIs deemed to be most relevant to this project were: **The World Bank Group (specifically, IDA and IBRD flows), The African Development Bank Group (AfDB), and The International Fund for Agricultural Development (IFAD)**. Other banks were excluded because they lacked up-to-date data or did not contribute to the nations of interest.

Supporting Sources: IFI data alone were insufficient to determine the scale of investment in the countries. **World Development Indicators (WDI) from the World Bank, the OECD Creditor Reporting System (CRS), and the ReSAKSS database (ReSAKSS)** were used as points of comparison, respectively, for demographic and population characteristics, bilateral Official Development Assistance flows, and national government expenditures on agriculture. EPAR also investigated Chinese investments into Sub-Saharan Africa, however these data were excluded due to poor data quality.

### **Step 1-3: Access, Download, and Import Data**

Data were drawn from several sources each with its own semantics for collection. As such, all data from the correct time period, countries of interest, and status were pulled from each data source to the extent applicable. Later steps handle filtering (i.e. the removal of non-agricultural projects). Data deemed relevant for download were projects that were either currently active at the time of download or were already approved for implementation and had a reliable commitment amount attached to the project.

AfDB (<https://projectsportal.afdb.org/dataportal/VProject/list>)

Bulk data downloads from the African Development Bank website were supplemented with an R script that downloaded otherwise unavailable data. Code is available at [this GitHub link](#). These data included: Project General Description, Project Objective, DAC Sector Code, and Planned Completion Date. This script pulled the data for the AfDB project IDs specified in `afdb-ids.txt` on Github, and output a CSV file for convenient import into Stata and Excel. These project IDs were identified through a simple filter on the website for “Approved” and “Implementation” status projects in the countries of interest. The only data-related decision at this stage was the inclusion/exclusion of AfDB project IDs.

IFAD (<https://www.ifad.org/en/web/operations/projects-and-programmes>)

IFAD data were manually downloaded via copy/paste into Excel, due to the limited nature of the data. In future, EPAR would develop a script to scrape these data from the website, since IFAD does not have a data portal from which to download project information.

World Bank Group - World Bank Project List and World Development Indicators

( <https://projects.worldbank.org/en/projects-operations/projects-list?os=0> and <https://datacatalog.worldbank.org/dataset/world-development-indicators>, respectively)

World Bank data were gathered by Python script that pulled from the official World Bank APIs for World Bank Projects (IFI data) and WDI (supporting data). Code is available at [this Github link](#). The scripts are under the `wbp/` and `wdi/` folders in this repository. These scripts pulled data for specific World Bank project IDs specified in their respective `wb-ids.txt` files. These project IDs were identified through a simple filter on the website for “Active” projects in the countries of interest. We downloaded data that is freely accessible on the World Bank website, but also pulled otherwise inaccessible data points including Project Abstract, Planned Closing Date, and Board Approval Date. Additionally the scripts format the data into a CSV for convenient import into Stata and Excel. Similar to AfDB data collection, the only data-related decision at this stage is the inclusion/exclusion of World Bank Project IDs.

OECD CRS (<https://stats.oecd.org/Index.aspx?DataSetCode=crs1>)

Four OECD data files were manually downloaded and exported to Excel: total Official Development Assistance (ODA) from Development Assistance Committee (DAC) countries, total ODA from non-DAC countries, total agricultural ODA from DAC countries, and total agricultural ODA from non-DAC countries. Neither DAC nor non-DAC country lists include China nor Brazil. Other filters included: All Channels, Constant Prices, Gross Disbursements, and All Types in 2019 constant US dollars (millions). These four data exports were combined into a single Excel document and represented bilateral investment and loan flows into Sub-Saharan Africa.

ReSAKSS (<https://www.resakss.org/node/11>)

Bulk data downloads from the ReSAKSS Tracking Indicators website were supplemented with a Python script that filtered and cleaned the relevant data. Code is currently not available on GitHub. The data downloaded include: government agriculture expenditure as a percent of total expenditure and government agriculture expenditure in constant 2010 dollars. We downloaded data that is freely accessible on the ReSAKSS website.

### Step 4-5: Clean and Re-Export Data

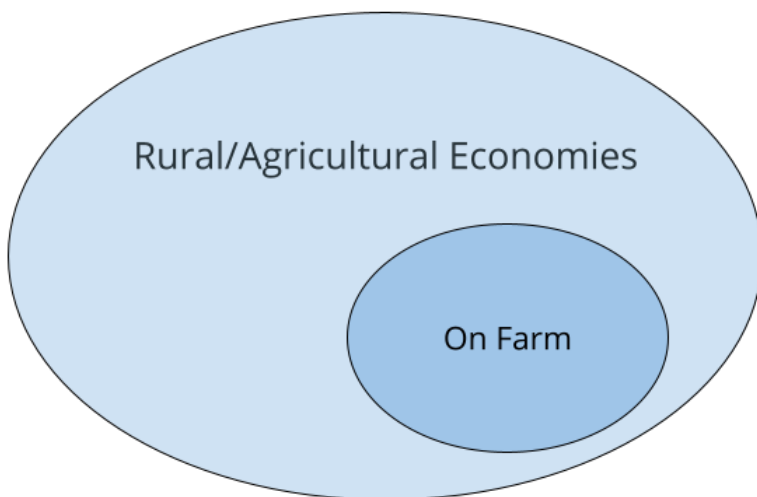
#### Manual Data Cleaning

Using an Index Match function in Excel, OECD CRS data were combined into two indicators: bilateral funding for agriculture in the most recent year available (2019), and bilateral funding for agriculture per capita (2019).

The three IFI project data were pulled into their own tabs within the #411 IFI Excel worksheet. Prior to formatting, we ensured that fields were consistent across data sources and imputed fields where possible (i.e. creating a Project Duration field using start and end dates for each project, averaging existing project durations for projects with missing values).

IFIs did not categorize project sectors in the same way; the AfDB uses DAC sector codes while the World Bank and IFAD use arbitrary sector categorization. Using IFAD's sector categorization as a starting point, we manually assigned sectors to either "On Farm" or "Rural/Agricultural Economies" categories to determine the

most relevant projects. We spotchecked individual projects to ensure that these categories correctly captured the projects of most interest. "On Farm" projects refer to sectors pertaining directly to smallholder land-based agriculture; Rural/Agricultural Economies is an expanded category in the vein of Inclusive Agricultural Transformation (IAT), encompassing those sectors which may have a broader impact on the livelihoods and wellbeing of smallholder farmers, such as infrastructure and commercializing products. Projects that did not fit into either of these categories were uncoded and deemed irrelevant to smallholder farmers in the countries of interest.



Once the disparate IFI sectors were categorized, the project data were imported into Stata for assignment into the categories.

### STATA Data Cleaning

#### *IFI Project Data (World Bank, AfDB, IFAD)*

For all three IFI's the cleaning process proceeded as follows. First, we imported the IFI project data into STATA and standardized the country names. In this format, each row of the data represented one IFI project. We created an annualized (non-discounted) funding field by dividing a project's total funding amount by the project duration. Next, we marked whether or not each IFI project was related to *Rural/Agricultural Economies* projects or *On Farm* projects based on the project's *Sector* field. Tab 9 (Methodology) of the #411 *IFI Excel Workbook* details which *Sectors* categories were classified in this way for each IFI.

We then collapsed the project data by country, producing a data set for each IFI where each row represented project information for one priority country. We also created a set of country-level aggregate project measures, including the annualized funding amount, number of projects, and share of country's funding and projects going related to *Rural/Agricultural Economies* projects and *On Farm* projects. We created this set of measures by country for each IFI, as well as a set by country that totaled values across all three IFIs. Finally, we exported this country-level information as two tabs in the #411 *IFI Excel Workbook*: Tab 4 (Investments by IFI), with the breakdowns by IFI; and Tab 3a (IFI aggregate) with the totals across all three IFIs.

#### *Supporting Data (WDI, OECD CRS, ReSAKKS)*

We imported each of these data sets, which were already structured so one row represented one country, into STATA. In addition to the measures found in the data, we constructed several new measures using the WDI data. These measures included the *number of total agricultural employees*, which we computed by multiplying the labor rate by the total population and then by the percent of employment that was in the agricultural sector. We also constructed measures for the *ten-year percentage point change in agricultural GDP* and *agricultural employment* by subtracting the 2009 values from the 2019 values for these fields.<sup>1</sup> Finally, we merged all three Supporting Data sets together and exported them into the #411 *IFI Excel Workbook* as Tab 3b (Comparatives).

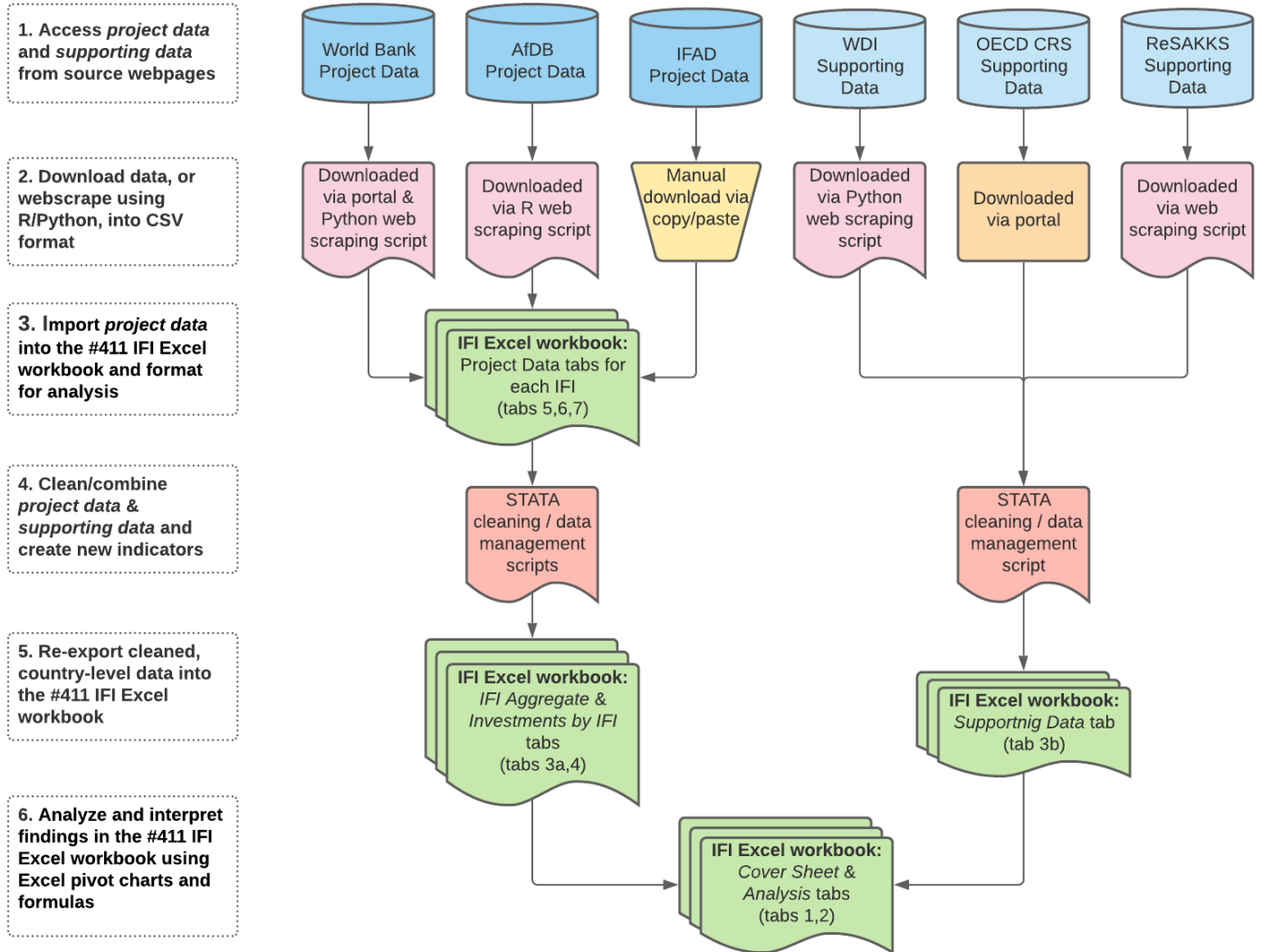
#### *Final Formatting Steps in Excel*

After export from STATA, we used Excel formulas to generate a "rank" for each country according to their performance by each aggregate indicator. Aggregate IFI data and supporting data were brought together in a temporary "dummy" table in order to generate pivot charts and graphs on a separate tab in Excel. We also reformatted with color and borders in Excel for clarity in reading the data.

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<sup>1</sup> We note that many of the measures found in all three Supporting Data sources were missing values for many of the countries in the data set.

## Appendix A: IFI Investment Workbook Data Process Flowchart



## **Appendix B: Data Sources**

[World Bank \(WB\)](#)

[African Development Bank \(AfDB\)](#)

[International Fund for Agricultural Development \(IFAD\)](#)

[World Development Indicators - World Bank \(WDI\)](#)

[Organization for Economic Cooperation and Development Stats \(OECD\)](#)

[Regional Strategic Analysis and Knowledge Support System \(ReSAKSS\)](#)

Web scraping scripts located at: <https://github.com/EvansSchoolPolicyAnalysisAndResearch/411-IFI-Aid/>