TECHNICAL NOTE

Building the Power BI dashboard on environmental mainstreaming in Cooperation Frameworks

Contents

Introduction

The objective of this technical note is to provide a step-by-step guide on how the Cooperation Framework Power BI dashboard was built. It contains detailed information on the data used for building the back end of the dashboard (what data sources were used and what data cleaning and data manipulation techniques were utilized), as well as the elements that make the front-end, such as visuals, buttons and filters.

This document is to be used as reference in future iterations of the dashboard.

What is the Cooperation Framework Dashboard?

The CF Analysis Dashboard is a simple interactive Power BI dashboard that provides users with information of environmental issues highlighted in the Cooperation Frameworks. The purpose is twofold:

- Serve as a front end of the central database for all Cooperation Frameworks data.
- Allow users to independently conduct ad hoc research and analysis of Cooperation Frameworks

The back end: data

The data used in the dashboard was obtained from two existing databases: the 2020 and 2021 CF Analysis data, and the 2022 CF Analysis.

From the 2020 and 2021 CF Analysis document, the following Excel sheets were used:

- Environment in CFs
  - Outcomes Table
  - Outputs Table
  - Indicators Table
- Charts
  - Tbl_EconomicGroupings
  - Tbl_Signatory
  - Tbl_MEAs

From the 2022 CF Analysis documents, the following excel sheets were used:

- CCA – CF List
- Results Framework
  - Outcomes Table
  - Outputs Table
  - Indicators Table
- MEAs

The related tables were merged into one central database. The database can be found here.

Database

The central database is comprised of 7 Excel sheets, each containing only one table. **Note:** Common columns, ID, Region, Country, and Year of development were all introduced to the tables to maintain consistency.

The snippet below is of one sheet contained in the Excel database, CF_DB_23. This file is stored in the Development Coordination Unit's SharePoint folder under Review CCA-CF/Power BI Dashboard.

Figure 1: Excel Database Snippet

Sheet 1 Containing ID_Table

Description: The ID_table has the primary key identifiers. Each cooperation framework entry constitutes a unique record, with the following naming convention adopted CF_XXX, where XXX represents Arabic numbers from in the order 001, 002 and so on and so forth. The field with the unique identifiers is [ID].

Sheet 2 Containing CF_List Table

Description: Contains descriptive information. The columns in CF_List table are ID, Region, Country, Economy, LDC, LLDC, SIDS, Country Grouping2, Type of Document, Period Covered, Year of Development, UNEP Signatory, UNEP Part of the Outcomes

The data for this table was obtained from CCA-CF List of the 2022 analysis and Tbl_EconomicGroupings , Tbl_Signatory from the 2020-2021 analysis.

Data Transformation

- The structure for the 2022 CCA-CF List data was adopted. Therefore, all the data was restructured to adopt the 2022 data.
- Common columns, ID, Region, Country, and Year of development were added.
- All blank rows were filled. For example, under LDC column, all the non-Yes columns were filled with 'No'

Sheet 3 Containing MEAs Table

Description: This table contains data related to NDCs, NBSAPs, and other MEAs. It shows whether different Cooperation Frameworks include actions to implement Multilateral Environmental Agreements (MEAs). The data in this table was taken from the MEAs table in the 2020-2021 analysis and the MEAs Excel sheet from the 2022 analysis. The fields in the merged MEAs table are NDCs action, NDCs generic, MEAs generic, MEAs Action, NBSAPs Action, and NOTES.

Data Transformation

- The existing structure of the tables was consistent and was therefore adopted.
- The first word of all the entries in the first five data fields was capitalized. For instance, all the 'yes' were converted to 'Yes' and 'no' to 'No'; all the asterisks were removed from the entries.
- Common columns, ID, Region, Country, and Year of development were added.

Sheet 4 Containing Results_Outcomes Table

Description: This table contains data on the integration of 27 environmental issues in the outcomes of the of the Cooperation Frameworks analyzed. The source of this table is the "Outcome Tables" from the 2020-2021, and 2022 CF analysis.

All the fields in the results outcomes revolve around common themes, Climate Change, Biodiversity Action, Pollution Action, and Cross Cutting Issues.

Data Transformation

- Took the existing data and harmonized the columns in 2020-2021 and 2022 CF analysis.
- Removed the extra header rows. Only the columns with the 27 environmental issues, Country, Region, Year of Development were maintained.
- Added columns count of all the values that fall under the main themes such as climate change, biodiversity, and pollution.
- Deleted the formulas at the end of the rows and columns.
- Added the common columns ID, Region, Country, and Year of development.

See Annex 1 for more detailed information on the transformation process from the fragmented tables to a harmonized Results_Outcomes table.

Sheet 5 Containing Results_Outputs Table

Description:

This table contains data on the integration of 27 environmental issues in the outcomes of the of the Cooperation Frameworks analyzed. The source of this table is the "Output Tables" from the 2020-2021, and 2022 CF analysis.

All the fields in the results outcomes revolve around common themes, Climate Change, Biodiversity Action, Pollution Action, and Cross Cutting Issues.

Data Transformation

- Took the existing data and harmonized the columns in 2020-2021 and 2022 CF analysis.
- Removed the extra header rows. Only the columns with the 27 environmental issues, Country, Region, Year of Development were maintained.
- Added columns count of all the values that fall under the main themes such as climate change, biodiversity, and pollution.

- Deleted the formulas at the end of the rows and columns.
- Added the common columns ID, Region, Country, and Year of development.

See Annex 1 for more detailed information on the transformation process from the fragmented tables to a harmonized Results_Outputs table.

Sheet 6 Containing Results_Indicators Table

Description: This table contains data on the integration of 27 environmental issues in the outcomes of the of the Cooperation Frameworks analyzed. The source of this table is the "Indicator Tables" from the 2020-2021, and 2022 CF analysis.

All the fields in the results outcomes revolve around common themes, Climate Change, Biodiversity Action, Pollution Action, and Cross Cutting Issues.

Data Transformation

- Took the existing data and harmonized the columns in 2020-2021 and 2022 CF analysis.
- Removed the extra header rows. Only the columns with the 27 environmental issues, Country, Region, Year of Development were maintained.
- Added columns count of all the values that fall under the main themes such as climate change, biodiversity, and pollution.
- Deleted the formulas at the end of the rows and columns.
- Added the common columns ID, Region, Country, and Year of development.

See Annex 1 for more detailed information on the transformation process from the fragmented tables to a harmonized Results_Indicators table.

Data Model

The image below shows the proposed relationships for the tables discussed in the section above.
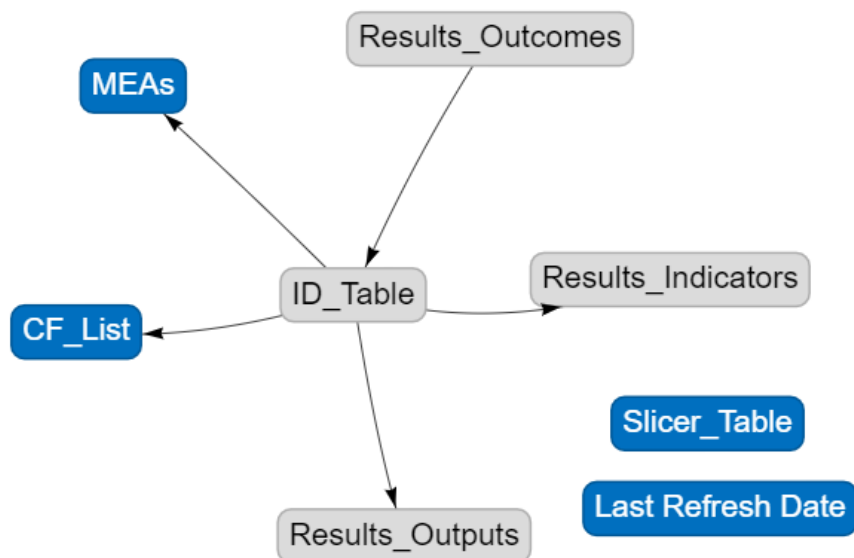
Figure 8: Model Diagram

As conceptualized, the relationships between the related tables were achieved with the ID field in all the columns used as the unique identifier. These relationships are as summarized in the ERD diagram shown in the snippet below:
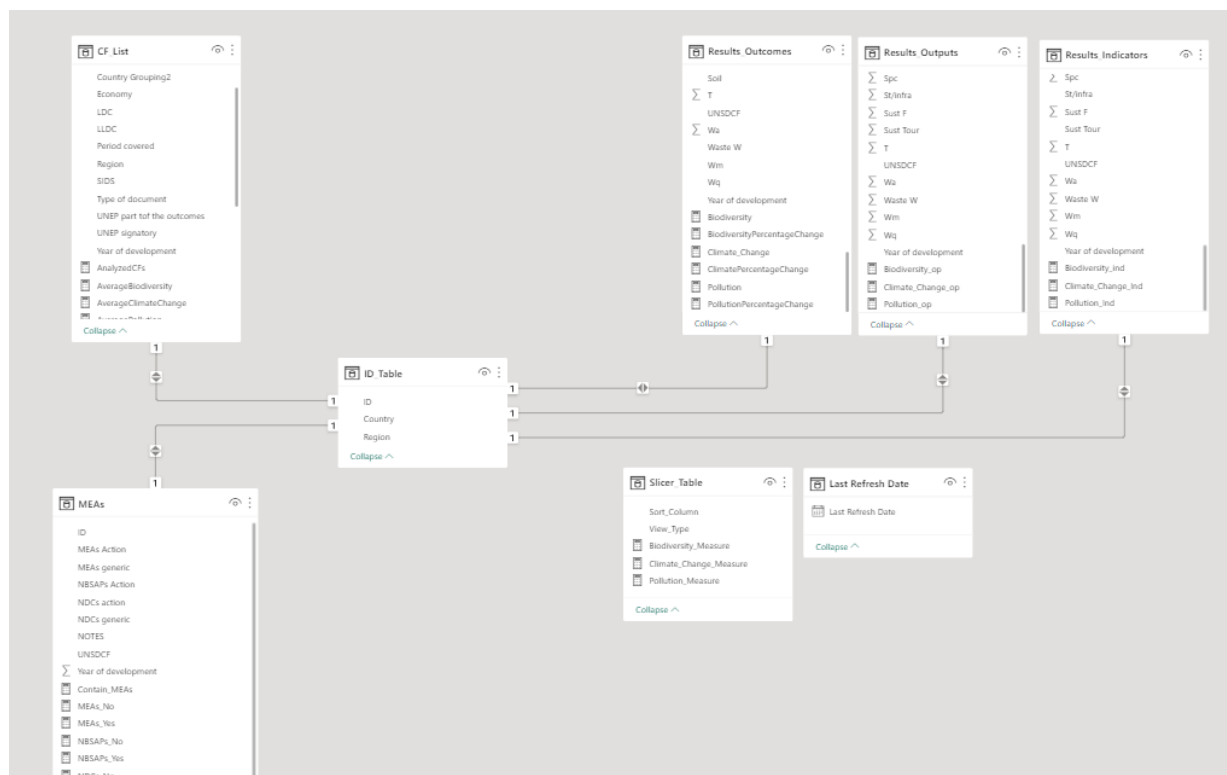
Figure 9: Entity Relationship Diagram (ERD)

The nature and cardinality of these relationships is as further broken down in the table below:

Table 1: Relationships

From	To	Is Active	Cardinality
ID_Table.ID	MEAs.ID	TRUE	One-to-Many
Results_Outcomes.ID	ID_Table.ID	TRUE	One-to-Many
ID_Table.ID	Results_Outputs.ID	TRUE	One-to-Many
ID_Table.ID	Results_Indicators.ID	TRUE	One-to-Many
ID_Table.ID	CF_List.ID	TRUE	One-to-Many

Calculated Fields and Dependencies

To create a new measure/calculated field this is the procedure to follow:

i. **Go to Data View:**

- Click on the "Data" view icon on the left side to see your data tables.

ii. **Select Table:**

- Click on the table that contains the column or fields you want to use in your measure.

iii. **Create New Measure:**

- Click on the "New Measure" button in the ribbon. Alternatively, you can right-click on the table and choose "New Measure."

iv. **Enter Formula:**

- In the formula bar, enter your calculation formula. For example, you can use DAX (Data Analysis Expressions) to perform calculations like SUM, AVERAGE, or create custom formulas.

v. **Press Enter:**

- After entering the formula, press Enter to create the measure.

vi. **(Re)Name Your Measure:**

- Rename the measure to something meaningful by typing a descriptive name in the formula bar.

There are several calculated fields (Measures) used to obtain specific metrics and data for visualization purposes. These measures, their dependencies as well as their coinciding DAX expressions are as shown in Table 2 below:

Table 2: Calculated Fields, Dependencies and DAX Expressions

Referencing Object	Referencing Object Type	Referenced Object	Referenced Object Type	Data Analysis Expression (DAX)

CF_List.AnalyzedCFs	Measure	CF_List.Country	Column	IF(
				    COUNTA(CF_List[Country]) > 0,
				    COUNTA(CF_List[Country]),
				    // Default
				    0
				)

CF_List.Least Developed Countries	Measure	CF_List.LDC	Column	IF(
				    COUNTROWS(FILTER(CF_List, CF_List[LDC] = "Yes")) > 0,
				    DIVIDE(
				        COUNTX(FILTER(CF_List, CF_List[LDC] = "Yes"), 1),
				        COUNTROWS(CF_List)
				    ),
				    0 // Replace with the desired default value
				    )

CF_List.Land Locked Developing Countries	Measure	CF_List.LLDC	Column	IF(
				    COUNTROWS(FILTER(CF_List,
				CF_List[LLDC] = "Yes")) > 0,
				    DIVIDE(
				        COUNTX(FILTER(CF_List,
				CF_List[LLDC] = "Yes"), 1),
				        COUNTROWS(CF_List)
				    ),
				    0
				)

CF_List.UNEP_signatory	Measure	CF_List.UNEP signatory	Column	IF(
				    COUNTROWS(FILTER('CF_List',
				'CF_List'[UNEP signatory] = "Yes")) > 0,
				        COUNTROWS(FILTER('CF_List',
				'CF_List'[UNEP signatory] = "Yes")),
				    0 //Default Value
				)

CF_List.Small Island Developing States	Measure	CF_List.SIDS	Column	IF(
				    COUNTROWS(FILTER(CF_List,
				CF_List[SIDS] = "Yes")) > 0,
				    DIVIDE(
				        COUNTX(FILTER(CF_List,
				CF_List[SIDS] = "Yes"), 1),
				        COUNTROWS(CF_List)
				    ),
				    0 // Default Value
				)

MEAs.MEAs_No	Measure	MEAs.MEAs Action	Column	CALCULATE(
				    COUNTROWS(MEAs),
				    MEAs[MEAs Action] = "No"
				)

MEAs.MEAs_Yes	Measure	MEAs.MEAs Action	Column	IF(
				    CALCULATE(
				        COUNTROWS(MEAs),
				        MEAs[MEAs Action] = "Yes"
				    ) > 0,
				    CALCULATE(
				        COUNTROWS(MEAs),
				        MEAs[MEAs Action] = "Yes"
				    ),
				    0 // Default
				)

MEAs.NBSAPs_No	Measure	MEAs.NBSAPs Action	Column	CALCULATE(
				    COUNTROWS(MEAs),
				    MEAs[NBSAPs Action] = "No"
				)

MEAs.NBSAPs_Yes	Measure	MEAs.NBSAPs Action	Column	IF(
				    CALCULATE(
				        COUNTROWS(MEAs),
				        MEAs[NBSAPs Action] = "Yes"
				    ) > 0,
				    CALCULATE(
				        COUNTROWS(MEAs),
				        MEAs[NBSAPs Action] = "Yes"
				    ),
				    0 // Default
				)

MEAs.NDCs_No	Measure	MEAs.NDCs action	Column	CALCULATE(
				    COUNTROWS(MEAs),
				    MEAs[NDCs action] = "No"
				)

MEAs.NDCs_Yes	Measure	MEAs.NDCs action	Column	IF(
				    CALCULATE(
				        COUNTROWS(MEAs),
				        MEAs[NDCs action] = "Yes"
				    ) > 0,
				    CALCULATE(
				        COUNTROWS(MEAs),
				        MEAs[NDCs action] = "Yes"
				    ),
				    0 // Default
				)

MEAs.QCPR_Indicator	Measure	MEAs.NDCs_Yes
		MEAs.NBSAPs_Yes
		MEAs.MEAs_Yes
			Measures	(
				    MEAs[NDCs_Yes] +
				MEAs[NBSAPs_Yes] + MEAs[MEAs_Yes]
				    ) / 3

MEAs.QCPR_Indicator_Percentage	Measure	MEAs.QCPR_Indicator	Measure	IF(
				    COUNTROWS('MEAs') > 0,
				    DIVIDE(
				
				IF(ISBLANK(MEAs[QCPR_Indicator]), 0,
				MEAs[QCPR_Indicator]),
				        COUNTROWS('MEAs')
				    ),
				    0 // Default
				)

MEAs.Contain_MEAs	Measure	MEAs.NDCs action
		MEAs.NBSAPs Action
			Columns	IF(
				    CALCULATE(
				        COUNTROWS(MEAs),
				        MEAs[NDCs Action] = "Yes" ||

		MEAs.MEA s Action MEAs.MEA s		MEAs[NBSAPs Action] = "Yes" || MEAs[MEAs Action] = "Yes"
				   ) > 0,
				   CALCULATE(
				     COUNTROWS(MEAs),
				     MEAs[NDCs Action] = "Yes" || MEAs[NBSAPs Action] = "Yes" || MEAs[MEAs Action] = "Yes"
				     //At least one Action, count is 1
				   ),
				   0 // Default
				)

Results_Outc omes.Biodiv ersity	Measure	Results_Ou tcomes.Bio Results_Ou tcomes.UN SDCF	Columns	IF(
				   COUNTA(Results_Outcomes[Bio]) > 0 &&
				 COUNTA(Results_Outcomes[UNSDCF]) > 0,
				   COUNTA(Results_Outcomes[Bio]) / COUNTA(Results_Outcomes[UNSDCF]),
				   0 //Default
				)

Results_Outc omes.Climat e_Change	Measure	Results_Ou tcomes.UN SDCF Results_Ou tcomes.Cli mate Change	Columns	IF(COUNTA(Results_Outcomes[UNSDCF]) > 0, (COUNTA(Results_Outcomes[UNSDCF]) - SUMX(FILTER(Results_Outcomes, Results_Outcomes[Climate Change] = 0), 1)) / COUNTA(Results_Outcomes[UNSDCF]), 0)
Results_Outc omes.Polluti on	Measure	Results_Ou tcomes.UN SDCF Results_Ou tcomes.Poll ution Action	Column	IF(COUNTA(Results_Outcomes[UNSDCF]) > 0, (COUNTA(Results_Outcomes[UNSDCF]) - SUMX(FILTER(Results_Outcomes, Results_Outcomes[Pollution Action] = 0), 1)) / COUNTA(Results_Outcomes[UNSDCF]), 0)

Slicer_Table. Climate_Cha nge_Measure	Measure	Slicer_Tabl e.View_Typ e	Column	SWITCH (
				   SELECTEDVALUE (Slicer_Table[View_Type]),
				   "Outcomes", Results_Outcomes[Climate_Change],
				   "Outputs",

				Results_Outputs[Climate_Change_op],
				    "Indicators",
				Results_Indicators[Climate_Change_Ind],
				    //"All",
				    //
				(Results_Outcomes[Climate_Change] +
				Results_Outputs[Climate_Change_op] +
				//Results_Indicators[Climate_Change_In
				d]) / 3,
				    BLANK()
				)

Slicer_Table.
Climate_Chan
nge_Measure
	Measure	Results_Ou
		tcomes.Cli
		mate_Chan
		ge
			Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Climate_Change],
				    "Outputs",
				Results_Outputs[Climate_Change_op],
				    "Indicators",
				Results_Indicators[Climate_Change_Ind],
				    //"All",
				    //
				(Results_Outcomes[Climate_Change] +
				Results_Outputs[Climate_Change_op] +
				//Results_Indicators[Climate_Change_In
				d]) / 3,
				    BLANK()
				)

Slicer_Table.
Climate_Cha
nge_Measure
	Measure	Results_Ou
		tputs.Clima
		te_Change_
		op
			Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Climate_Change],
				    "Outputs",
				Results_Outputs[Climate_Change_op],
				    "Indicators",
				Results_Indicators[Climate_Change_Ind],
				    //"All",
				    //
				(Results_Outcomes[Climate_Change] +
				Results_Outputs[Climate_Change_op] +
				//Results_Indicators[Climate_Change_In
				d]) / 3,
				    BLANK()
				)

Slicer_Table.Climate_Change_Measure	Measure	Results_Indicators.Climate_Change_Ind	Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Climate_Change],
				    "Outputs",
				Results_Outputs[Climate_Change_op],
				    "Indicators",
				Results_Indicators[Climate_Change_Ind],
				    //"All",
				    //
				(Results_Outcomes[Climate_Change] +
				Results_Outputs[Climate_Change_op] +
				//Results_Indicators[Climate_Change_Ind]) / 3,
				    BLANK()
				)

Slicer_Table.Biodiversity_Measure	Measure	Slicer_Table.View_Type	Column	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Biodiversity],
				    "Outputs",
				Results_Outputs[Biodiversity_op],
				    "Indicators",
				Results_Indicators[Biodiversity_ind],
				    //"All",
				    // (Results_Outcomes[Biodiversity] +
				Results_Outputs[Biodiversity_op] +
				/Results_Indicators[Biodiversity_ind]) / 3,
				    BLANK()
				)

Slicer_Table.Biodiversity_Measure	Measure	Results_Outcomes.Biodiversity	Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Biodiversity],
				    "Outputs",
				Results_Outputs[Biodiversity_op],
				    "Indicators",
				Results_Indicators[Biodiversity_ind],
				    //"All",
				    // (Results_Outcomes[Biodiversity] +
				Results_Outputs[Biodiversity_op] +
				/Results_Indicators[Biodiversity_ind]) / 3,
				    BLANK()
				)

Slicer_Table.Biodiversity_Measure	Measure	Results_Outputs.Biodiversity_op	Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Biodiversity],
				    "Outputs",
				Results_Outputs[Biodiversity_op],
				    "Indicators",
				Results_Indicators[Biodiversity_ind],
				    //"All",
				    // (Results_Outcomes[Biodiversity] +
				Results_Outputs[Biodiversity_op] +
				/Results_Indicators[Biodiversity_ind]) /
				3,
				    BLANK()
				)

Slicer_Table.Biodiversity_Measure	Measure	Results_Indicators.Biodiversity_ind	Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Biodiversity],
				    "Outputs",
				Results_Outputs[Biodiversity_op],
				    "Indicators",
				Results_Indicators[Biodiversity_ind],
				    //"All",
				    // (Results_Outcomes[Biodiversity] +
				Results_Outputs[Biodiversity_op] +
				/Results_Indicators[Biodiversity_ind]) /
				3,
				    BLANK()
				)

Slicer_Table.Pollution_Measure	Measure	Slicer_Table.View_Type	Column	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Pollution],
				    "Outputs",
				Results_Outputs[Pollution_op],
				    "Indicators",
				Results_Indicators[Pollution_Ind],
				    //"All",
				    // (Results_Outcomes[Pollution] +
				Results_Outputs[Pollution_op] +
				Results_Indicators[Pollution_Ind]) / 3,
				    BLANK()
				)

Slicer_Table. Pollution_Me asure	Measure	Results_Ou tcomes.Poll ution	Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Pollution],
				    "Outputs",
				Results_Outputs[Pollution_op],
				    "Indicators",
				Results_Indicators[Pollution_Ind],
				    //"All",
				    // (Results_Outcomes[Pollution] +
				Results_Outputs[Pollution_op] +
				Results_Indicators[Pollution_Ind]) / 3,
				    BLANK()
				)

Slicer_Table. Pollution_Me asure	Measure	Results_Ou tputs.Pollut ion_op	Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Pollution],
				    "Outputs",
				Results_Outputs[Pollution_op],
				    "Indicators",
				Results_Indicators[Pollution_Ind],
				    //"All",
				    // (Results_Outcomes[Pollution] +
				Results_Outputs[Pollution_op] +
				Results_Indicators[Pollution_Ind]) / 3,
				    BLANK()
				)

Slicer_Table. Pollution_Me asure	Measure	Results_Ind icators.Poll ution_Ind	Measure	SWITCH (
				    SELECTEDVALUE (
				Slicer_Table[View_Type]),
				    "Outcomes",
				Results_Outcomes[Pollution],
				    "Outputs",
				Results_Outputs[Pollution_op],
				    "Indicators",
				Results_Indicators[Pollution_Ind],
				    //"All",
				    // (Results_Outcomes[Pollution] +
				Results_Outputs[Pollution_op] +
				Results_Indicators[Pollution_Ind]) / 3,
				    BLANK()
				)

Results_Outputs.Biodiversity_op	Measure	Results_Outputs.Bio Results_Outputs.UNSDCF	Columns	IF(
				    COUNTA(Results_Outputs[Bio]) > 0 && COUNTA(Results_Outputs[UNSDCF]) > 0,
				    COUNTA(Results_Outputs[Bio]) / COUNTA(Results_Outputs[UNSDCF]),
				    0 //default
				)

Results_Outputs.Climate_Change_op	Measure	Results_Outputs.UNSDCF Results_Outputs.Climate Change	Columns	IF(
				    COUNTA(Results_Outputs[UNSDCF]) > 0,
				    (COUNTA(Results_Outputs[UNSDCF]) - SUMX(FILTER(Results_Outputs, Results_Outputs[Climate Change] = 0), 1)) / COUNTA(Results_Outputs[UNSDCF]),
				    0
				)

Results_Outputs.Pollution_op	Measure	Results_Outputs.UNSDCF Results_Outputs.Pollution Action	Columns	IF(
				    COUNTA(Results_Outputs[UNSDCF]) > 0,
				    (COUNTA(Results_Outputs[UNSDCF]) - SUMX(FILTER(Results_Outputs, Results_Outputs[Pollution Action] = 0), 1)) / COUNTA(Results_Outputs[UNSDCF]),
				    0
				)

Results_Indicators.Biodiversity_ind	Measure	Results_Indicators.Bio Results_Indicators.UNSDCF	Columns	IF(
				    COUNTA(Results_Indicators[Bio]) > 0 && COUNTA(Results_Indicators[UNSDCF]) > 0,
				    COUNTA(Results_Indicators[Bio]) / COUNTA(Results_Indicators[UNSDCF]),
				    0 //Default is zero if num/denom is zero//
				)

Results_Indicators.Climate_Change_Ind	Measure	Results_Indicators.UNSDCF Results_Indicators.Climate Change	Columns	IF(COUNTA(Results_Indicators[UNSDCF]) > 0, (COUNTA(Results_Indicators[UNSDCF]) - SUMX(FILTER(Results_Indicators, Results_Indicators[Climate Change] = 0), 1)) / COUNTA(Results_Indicators[UNSDCF]), 0)

Results_Indicators.Pollution_Ind	Measure	Results_Indicators.UNSDCF Results_Indicators.Pollution Action	Columns	IF(COUNTA(Results_Indicators[UNSDCF]) > 0, (COUNTA(Results_Indicators[UNSDCF]) - SUMX(FILTER(Results_Indicators, Results_Indicators[Pollution Action] = 0), 1)) / COUNTA(Results_Indicators[UNSDCF]), 0)

The front-end: pages, graphs, and visualizations

The dashboard contains * pages. These are:

- Summary Page
- XXXX

Each of the pages contains visuals that are all described in this product documentation. The purpose of this dashboard is to provide users with near real time findings of the visuals that have since been considered important or most informative based on the feedback from previous CF analysis reports.

Summary Page

The purpose of the summary page is to provide an overview of how the triple planetary crisis of climate change, biodiversity loss and pollution is addressed in the cooperation frameworks analyzed, as well as some key information of the countries that developed the major visualizations that provide major messages from cooperation frameworks.

The summary page, therefore, features information on:

- Number of Cooperation Frameworks
- Number of Cooperation Frameworks signed by UNEP.
- Number of Cooperation Frameworks containing MEAs
- Percentage of Least Developed Countries (LDCs) with an analyzed cooperation
- Percentage of Land Locked countries with an analyzed cooperation framework
- Percentage of Small Island Developing Countries (SIDs) with an analyzed cooperation framework
- Geographic distribution of the countries whose cooperation frameworks have been analyzed.
- The triple planetary crisis in the outcomes, outputs, and indicators of cooperation frameworks
- Number of NDCs, NBSAPs, and other MEAs actions in analyzed Cooperation Frameworks
- Percentage of analyzed Cooperation Frameworks with linkages to NDCs, NBSAPs and other MEAs.

The summary page also contains slicers to filter cooperation frameworks by year, region, country and outcomes, outputs, and indicators.

Visualizations

The summary page has a total of twenty-five visuals that fall into either of these categories:

i.   Slicer
ii. Action Button
iii. Card

iv.   Shape
v.   Textbox
vi.   Gauge
vii. Clustered Column Chart
viii. Filled Map
ix.   Donut Chart
x.   Line Chart

Below is a snippet of all the visuals on the page:
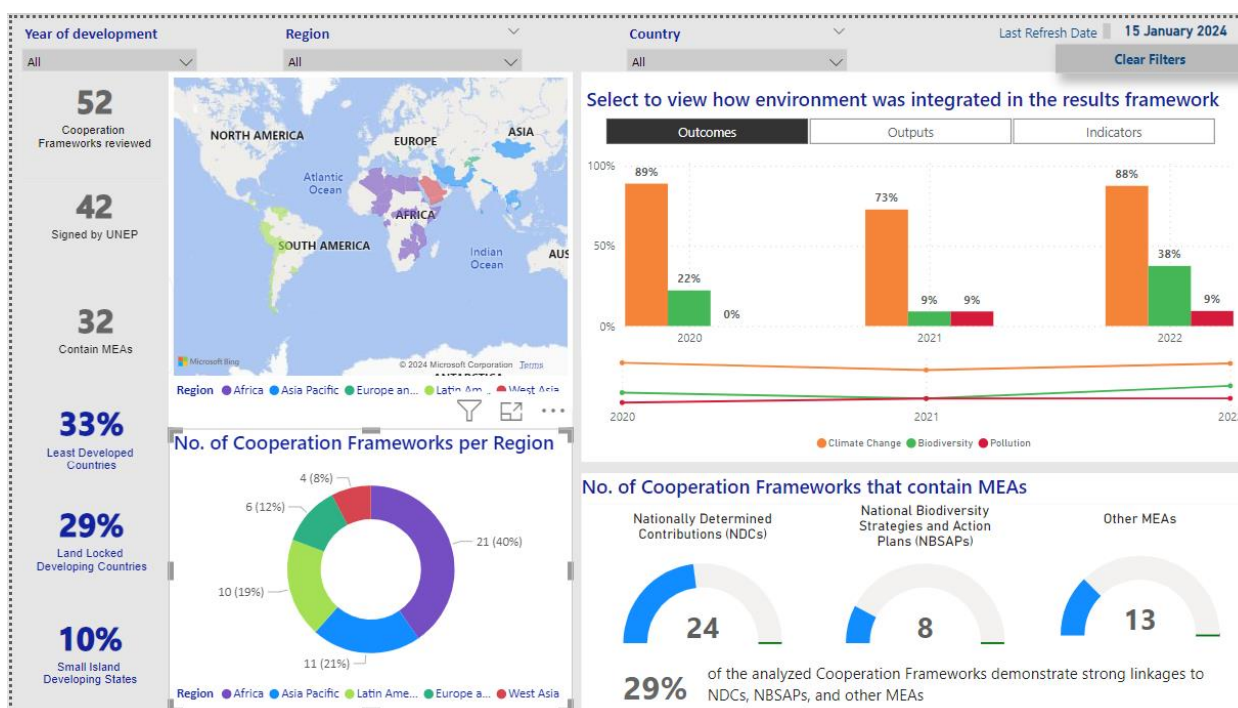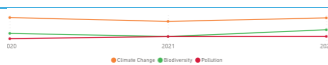
Figure 3: Summary Page
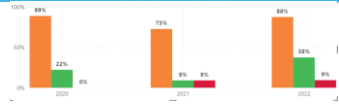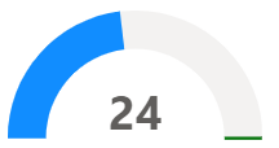
All the data visuals in the report are discussed in detail in this next section.

Visuals

Table 3: Description of Visuals

	Visual	Type	Fields Used	Purpose
1.	Year of development — 2020	Slicer	CF_List.Year of development	This allows the user to filter the data for each year
2.	Region — All	Slicer	Cf_List.Region	Allows for filtering by region
3.	Country — All	Slicer	CF_List.Country	Allows for filtering by country name

4.	52 Cooperation Frameworks reviewed	Card	CF_List.Analyzed CFs	This shows the total number of Cooperation Frameworks under review depending on the active filters
5.	42 Signed by UNEP	Card	CF_List.UNEP_Signatory	This displays the number of Cooperation Frameworks for which UNEP was a signatory
6.	Country and Region (filled map)	Filled map	CF_List.Country CF_List.Region	This map displays the geographical location of the regions and(or) countries under review based on the filters applied
8.	33% Least Developed Countries 29% Land Locked Developing Countries 10% Small Island Developing States	Three cards	CF_List.Least Developed Countries CF_List.Land Locked Developing Countries CF_List.Small Island Developing States	These cards show the distribution of the country groupings of the selected countries. Once country might fall under more than one of the categories
9.	Select to view how environment was integrated in the results framework (Outcomes, Outputs, Indicators)	Slicer	Slicer_Table.View_Type	This is a slicer that allows the user to toggle between the outcomes, the outputs and indicators in the results framework. The slicer controls the clustered bar chart and line graph for the triple planetary crisis data
10.	Line chart (Climate Change, Biodiversity, Pollution)	Line chart	CF_List.Year of development Slicer_Table.Biodiversity _Measure Slicer_Table.Climate_Ch ange_Measure Slicer_Table.Pollution_M easure	This graph shows the trend of climate change, biodiversity, and pollution in the results framework depending on the applied filter in the selected year range. Hovering over the graph allows the user to view that actual values for each of the triple planetary crisis. This visual is responsive to all the slicers on the page.

11.		Clustered Column Chart	Year of development Slicer_Table.Biodiversity_Measure Slicer_Table.Climate_Change_Measure Slicer_Table.Pollution_Measure	This chart displays the triple planetary crisis in the selected years. It is affected by the slicer in (9.) above. Changing the selection on the slicer changes the chart depending on the selections. Similarly, just like the line chart above, hovering over the chart gives the actual values. This visual is affected by all the other slicers on the page.
12.	Nationally Determined Contributions (NDCs) 24	Gauge	CF_List.AnalyzedCFs MEAs.NDCs_Yes	The gauge displays the number of NDCs actions in the analyzed cooperation frameworks. The value displayed is the number of actions against all the analyzed CFs selected.
13.	National Biodiversity Strategies and Action Plans (NBSAPs) 8	Gauge	CF_List.AnalyzedCFs MEAs.NBSAPs_Yes	The gauge displays the number of NBSAPs actions in the analyzed cooperation frameworks. Value displayed: Ditto (see 12. above)
14.	Other MEAs 13	Gauge	CF_List.AnalyzedCFs MEAs.MEAs_Yes	The gauge displays the number of MEAs actions in the analyzed cooperation frameworks. Value displayed: See 12. above
15.	29% of the analyzed Cooperation Frameworks demonstrate strong linkages to NDCs, NBSAPs, and other MEAs	Card and text box	MEAs. QCPR_Indicator_Percentage	This shows the QCPR percentage, which is a measure of how cooperation frameworks are linked to NDCs, NBSAP,s and other MEAs
16.	Last Refresh Date 15 January 2024	Text box and Card	Last Refresh Date.Last Refresh Date	This is a card that displays the last date the report was refreshed
17.	**Clear Filters**	Action Button		This is a button for clearing all the applied slicers/filters in the report

*Text Boxes and Shapes used in this page are not described because they are self-explanatory and are not dependent on any of the data neither do they perform any actions.

Slicers and Filters

All the slicers at the top of the page, i.e., Slicers 1, 2, 3 in Table 3 above affect all the visuals on the page. However, slicer nine affects only visuals 10 and 11. This means visuals 10 and 11 are each affected by all the four slicers.

Contact Information

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Annex

Annex 1

Sample Demonstration of the Data Transformation Process

Below is a step-by-step procedure of cleaning and transforming the Results_Outcomes data to be used in the dashboard. The Results_Outputs and Results_Indicators go through the same data transformation process. The source of the data was this file for the 2022 analysis and this file for the 2020 - 2021 analysis. Before transformation and cleaning the 2020-2021, and 2022 data looks as shown below:

Figure 2: Results Framework 2020-2021

As you can see from figure 2, the sheet that contains information on the outcomes of CFs also contains the results framework for the outputs and the indicators. However, since the intention is to have each table in an independent sheet, the results outcomes table (circled in red) was separated from the rest of the data. This was done for the outcomes, the outputs and the indicators. For demonstration purposes only the transformation for the results outcomes is shown.

The figure below shows a close-up of the results outcomes (circled):

UNSDCF	Outcomes	Outcomes with environ/ issues	%	Ad	Mt	En	Re	Rm	Wa	Om	Bi	Forest	Land	Aq	Wq	Ocean Q	Soil	Wm	Chem	Circ Eco	Spc	St/infra	Sc	Sa	Sust Tour	Sust F	Green eco
				CLIMATE CHANGE					**BIODIVERSITY ACTION**					**POLLUTION ACTION**							**CROSS CUTTING**						
				Climate Change			Disaster risk management and resilience		Sustainable management of water - related ecosystems		Conservation and sustainable management of natural resources, biodiversity and ecosystems			Environmental quality							Economic Tranformation						Gov
Eswatini	4	1	25%	1	1		1				1										1						1
Armenia	8	2	25%				1				1										1						1
Viet Nam	4	2	50%	1	1	1	1	1			1									1							1
Somalia	13	4	31%				1	1			1																
Uruguay	12	1	8%																		1						
Eritrea	4	1	25%				1	1			1																
Mozambique	4	2	50%				1				1																
Tanzania			#DIV/0!																								
Zimbabwe	4	2	50%																		2						1
Botswana	5	2	40%				1				1																1
Lao PDR	4	1	25%				1	1			1																1
Bangladesh	5	2	40%	1	1		1	1			1																1
Thailand	3	1	33%		1																						1
Maldives	4	2	50%				1				1		1														1
Yemen			#DIV/0!																								
Saudi Arabia	4	2	50%	1	1						1		1								1						
Albania	4	1	25%	1	1																						1
El Salvador	7	2	29%	1	1		1	1													1						1
Honduras	9	1	11%																								
Peru	6	2	33%	1	1		1	1			1										1						1
Total	104	31	30%	7	8	1	12	7	0	0	12	0	2	0	0	0	0	0	0	1	8	0	0	0	0	0	12
Percentage	100%	30%		11%	12%	2%	18%	11%	0%	0%	18%	0%	3%	0%	0%	0%	0%	0%	0%	2%	12%	0%	0%	0%	0%	0%	18%
UNSDCF	20	-	100%	7	8	1	12	7	0	0	12	0	2	0	0	0	0	0	0	1	7	0	0	0	0	0	12
Percentage	100%	-		35%	40%	5%	60%	35%	0%	0%	60%	0%	10%	0%	0%	0%	0%	0%	0%	5%	35%	0%	0%	0%	0%	0%	60%

Figure 3: Results Outcomes 2020 – 2021

Similarly, the data for 2022 analysis is all combined in one Excel sheet, as shown in the figure below:

Figure 4: Results Framework 2022

The outcomes section for 2022 is as shown below:

| Signature	UNSDCF	Outcome	Outco	%	Mt	En	Loss a	Re	Rm	Conflict	Wa	Om	Bio	Nat Res	Forest	Land	Desert	Poll*	Aq	Wq	Ocean	Soil	Wm	Chem	Haz	Waste W	SCP
					CLIMATE CHANGE						**BIODIVERSITY ACTION**							**POLLUTION ACTION**									
					Climate Change			Disaster risk management and resilience			Sustainable management of water - related ecosystems		Conservation and sustainable management of natural resources, biodiversity and ecosystems					Environmental quality									
no	Algeria	4	1	25%	1	1			1				1			1	1										
yes	Benin	3	1	33%					1																		
yes	Burundi	5	1	20%					1					1													
yes	Cabo Verde	4	1	25%				1	1			1	1		1												
no	CAR	7	1	14%										1													
yes	Egypt	4	2	50%				1						1													
n/a	Gabon	3	1	33%				1						1													
no	Libya	7	1	14%				1			1			1													
yes	Niger	3	1	33%				1						1													
yes	Nigeria	12	2	17%		1		2	2					1													
yes	Sao Tome & Prin.	4	2	50%	1	1																					
yes	South Sudan	4	1	25%																							
yes	Togo	5	1	20%				1	1					1													
yes	Zambia	4	1	25%				1						1	1												
yes	Lebanon	8	1	13%					1																		
yes	oPt	4	1	25%				1							1												
yes	Iran	5	2	40%	1			1	1					1	1												
N/a	Micronesia	4	2	50%				1						1													
yes	Mongolia	4	2	50%	1																						
yes	Nepal	4	2	50%				1	1																		
yes	Pakistan	5	1	20%										1													
yes	Sri Lanka	6	2	33%	1			1	1					1	1												
yes	Kyrgyzstan	4	2	50%				1	1					1	2												
yes	Moldova	4	1	25%	1				1						1												
yes	Montenegro	4	1	25%	1										1												
no	Tajikistan	4	2	50%					1						1												
	Bolivia	11	2	18%			1		1						1												
yes	Chile	12	4	33%	1			1	1		1	1	1	1												1
yes	Costa Rica	12	4	33%	2				1					1						1						
yes	Ecuador	4	2	50%	1			1						1			1			1						
yes	Haiti	5	1	20%					1					1													
yes	Venezuela	11	5	45%	1									1													
	UNSDCF	32																									
	Percentage	82%																									
	Total																										
	Percentage																										
	Cumulative					28									12									2				
	percentage						88%								38%									6%				

Figure 5: Results Outcomes 2022

To clean up the data the following steps were taken:

- Identifying the important columns and their order
- Removing the header rows such as pollution action andclimate change
- Dropping the unnecessary columns such as signature, T, issues and the outcomes columns as these would not be necessary for visualization.
- Noting the formulae used in the calculations at the end of the table.

Actions taken:

i. Having all the outcomes in an independent table
ii. Merging the tables, while maintaining the consistency in the columns' names
iii. Introducing new columns depending on the formulae used. In this case, for the triple planetary crisis, the columns: [climate change], [biodiversity action], and [pollution action] with counts of the data were introduced.
iv. Different colors for noting the different themes.

v.   Introducing the ID, Region and Year of development columns

The combined Results_Outcomes table looks as shown in the figure below:

ID	Region	UNSDCF	Year of development	Outcomes	Outcomes with environ/issues	%	Ad	Mt	En	Loss and Damage	Re	Rm	Conflict	Climate Change	Wa	Om	Bio	Nat Res	Forest	Land	Desert	Biodiversity Action	Poll*	Aq	Wq	Ocean Q	Soil
CF_001	Africa	Eswatini	2020	4	1	25%	1	1			1			3				1				1					
CF_002	Europe and Central Asia	Armenia	2020	8	2	25%					1			1			1	1				2					
CF_003	Asia Pacific	Viet Nam	2021	4	2	50%	1	1	1		1	1		4				1				1					
CF_004	Africa	Somalia	2020	13	4	31%					1	1		1				1				1					
CF_005	Latin America and Caribbean	Uruguay	2020	12	1	8%								0								0					
CF_006	Africa	Eritrea	2021	4	1	25%					1	1		1				1				1					
CF_007	Africa	Mozambique	2021	4	2	50%					1			1				1				1					
CF_008	Africa	Tanzania	2021	4	2	50%			1		1	1		2				1				1					
CF_009	Africa	Zimbabwe	2021	4	2	50%								0								0					
CF_010	Africa	Botswana	2020	5	2	40%					1			1				1				1					
CF_011	Asia Pacific	Lao PDR	2021	4	1	25%					1	1		1				1				1					
CF_012	Asia Pacific	Bangladesh	2020	5	2	40%	1	1			1	1		3			1	1				2					
CF_013	Asia Pacific	Thailand	2021	3	1	33%		1						1								0					
CF_014	Asia Pacific	Maldives	2020	4	2	50%					1			1				1		1		2					
CF_015	West Asia	Yemen	2021	4	1	25%								0								0					
CF_016	West Asia	Saudi Arabia	2020	4	2	50%	1	1						2				1		1		2					
CF_017	Europe and Central Asia	Albania	2020	4	1	25%	1	1						2								0					
CF_018	Latin America and Caribbean	El Salvador	2021	7	2	29%	1	1			1	1		3								0					
CF_019	Latin America and Caribbean	Honduras	2021	9	1	11%								0								0					
CF_020	Latin America and Caribbean	Peru	2021	6	2	33%					1	1		3				1		1		2					
CF_021	Africa	Algeria	2022	4	1	25%	1	1	1				1	3		1						3		1	1		
CF_022	Africa	Benin	2022	3	1	33%								1								0					
CF_023	Africa	Burundi	2022	5	1	20%	1							1				1				1					
CF_024	Africa	Cabo Verde	2022	4	1	25%					1	1		1		1	1			1		3					
CF_025	Africa	Central African R	2022	7	1	14%								0				1				1					
CF_026	Africa	Egypt	2022	4	2	50%					1			1				1				1					
CF_027	Africa	Gabon	2022	3	1	33%					1			1				1				1					
CF_028	Africa	Libya	2022	7	1	14%					1			1	1			1				2					
CF_029	Africa	Niger	2022	3	1	33%					1			1				1				1					
CF_030	Africa	Nigeria	2022	12	2	17%					1			2				1				1					

Sheet tabs: ID_Table | CF_List | **Results_Outcomes** | Results_Outputs | Results_Indicators | MEAs | Slicer_Table ...

Ready   Accessibility: Investigate

Figure 6: Combined Results Outcomes

With the data as in fig.5 no further transformations are required in the Power BI platform, and it is possible to replicate all prior formulas as was the case in the fragmented tables. The formulas used for this table are contained in Table 2 .