

Project Design

Visualizing US Foreign Aid: Trends, Allocation, and Impact

Participants:

1. Rishika Reddy Karra – Z2031118
2. Sufiyan Abdullah Ghorl Mohammed – Z2037215

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Good Designs

Design 1

LAYOUT



INFORMATION

Task

Explore how funding is distributed based on transaction type

OPERATIONS

Initial View:

- A geographical map displays the funding distribution amounts across countries using a blue color gradient.

Interactive Region Click:

- Clicking on a specific region zooms into that area for a detailed view.
- A pie chart appears over the selected region, showing the distribution of funding by transaction types (e.g., Type A and Type B).
- Dynamic Interaction

FOCUS



DISCUSSIONS

- Overlaid Pie Chart Obscures the Map
- Once zoomed in, the funding amount scale disappears or is not visibly accessible.

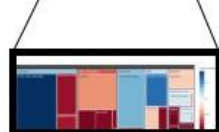
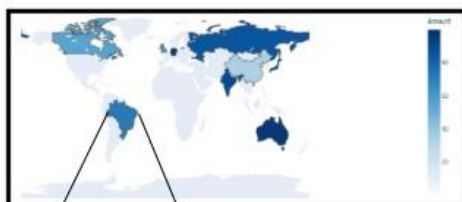
Design 2

LAYOUT

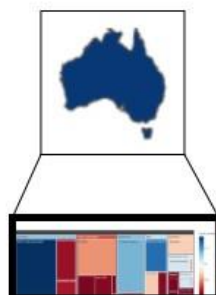


FOCUS

Selecting Country



Selecting Region



INFORMATION

Task

Explore how foreign assistance funding is distributed across regions and countries over time, and analyze how these funds are allocated across different categories and sectors.

OPERATIONS

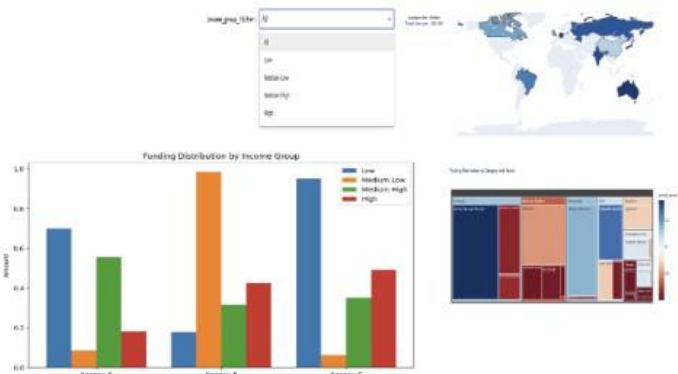
- **Overview** - aggregated funding data across all years and regions in both the map and treemap.
- Selecting a **specific year** filters both views to show data for that year only.
- Selecting a **region** zooms into that region on the map. Both the map and treemap update to reflect only the selected region's data.
- **Reference lines** connect the edge of the map to the treemap, visually linking geographical areas to category/sector funding.
- **Clicking on a country** in the map filters the treemap to show that country's funding distribution by category and sector.
- The map **does not zoom in or change view**. The reference lines, which were previously drawn from the map's bounding box, now connect **directly to the border of the selected country**.
- Activating the **play button** initiates an animation that cycles through the available fiscal years sequentially.
- Both the map and treemap update automatically for each year, enabling users to **observe how funding patterns evolve over time**.

DISCUSSIONS

1. Do we need the play animation, seeing trend for so many years sequentially?
 1. problem
 1. It adds up to cognitive load.
 2. It becomes even harder with treemap to remember.
 2. Solutions
 1. The animation should only show for the GeoMap?
 2. An Extra line chart at the top of GeoMap to show regionwise trend.
 3. Comparative Teemap?
2. What could be the color Maps to be used?

Design 3

LAYOUT



Task

Explore how funding is distributed based on each income level among different countries, categories and sectors.

OPERATIONS

- Initial View:**
- Grouped bar chart displays funding distribution by income level across agencies.
 - World map visualizes total funding amounts geographically.
 - Treemap shows distribution of funding across all categories and sectors.
- On Hovering Over an Agency (in Bar Chart):**
- Grouped bars disappear.
 - A single bar appears showing the total funding amount for the hovered agency.

FOCUS

Filtering based on Funding Agency



- On Selecting an Income Group (from Dropdown):**
- Map updates to reflect funding amounts for the selected income group.
 - Treemap updates to show funding distribution across categories and sectors for that group.

DISCUSSIONS

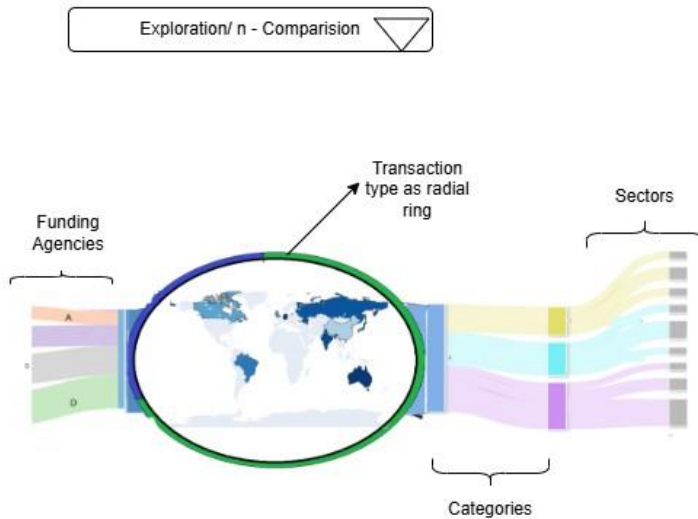
- Treemap Labels Are Small and Cluttered

Filtering based on Income Level



Design 4

LAYOUT



INFORMATION

Task

Explore how funding is distributed across spending categories, sectors and funding agencies within each region, and analyze the breakdown of transaction types for these.

OPERATIONS

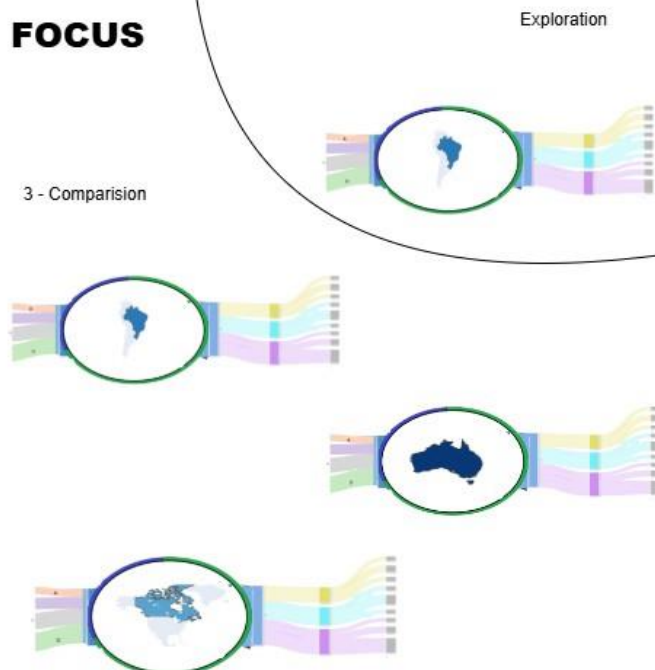
Overview

Aggregated view of all regions for funding agencies, categories and sectors as well as transactiontype breakdown for total amount (amount would be shown below each region).

Exploration selected - User can click only 1 region and that gets zoomed in and other are filtered for the same region.

n - Comparison selected - n duplicate charts get created and user can select different regions in them.

FOCUS

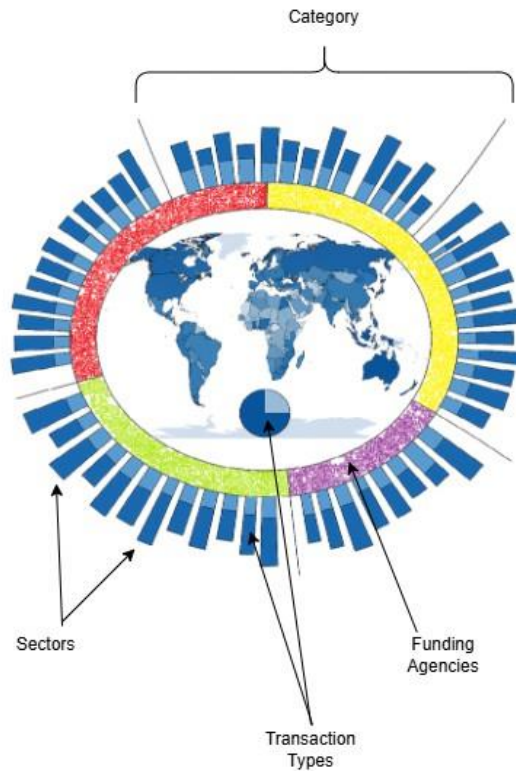


DISCUSSIONS

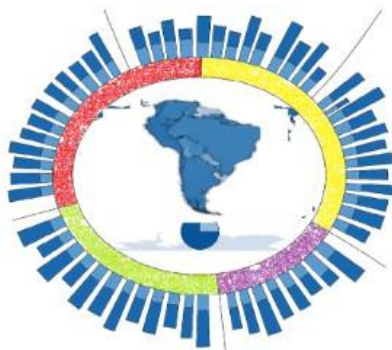
1. Amounts are shown with text, also can be added as tooltip.
2. A 3rd level of hierarchy can be added as activity name attribute, but it might create more clutter.
3. We can add filtering based on funding agency and category also, by providing users interactivity in that also.

Bad Design

LAYOUT



FOCUS



INFORMATION

Task

Explore how funding is distributed across spending categories, sectors and funding agencies within each region, and analyze the breakdown of transaction types for these.

OPERATIONS

Overview - Aggregated values for all attributes.

- Clicking on a region updates all attributes.
- Hovering over inner pie segments shows amount of funding by that agency.
- Hovering over outer arc shows amount of funding in that category.
- Hovering over the bar shows amount of funding that sector and the split by transaction type.
- The inner pier shows split by transaction type for the overall value.

DISCUSSIONS

- The combination of a map, pie chart, multiple bars, transaction type splits, and arcs **all packed into one circular space** can become visually dense.
- For regions with a large number of sectors or categories, **bars may overlap or become too thin** to interpret clearly.
- Since everything is radial, it's **harder to compare bar heights** accurately, especially when they follow a circular layout rather than being aligned along a straight axis.
- Important quantitative values (e.g., amounts) are only available **on hover**, which could be inaccessible or annoying for quick comparisons or screen reader users.
- Misleading spatial alignment between bars and category arcs may falsely imply a direct hierarchical relationship between funding agency and category/sector.

Final Design

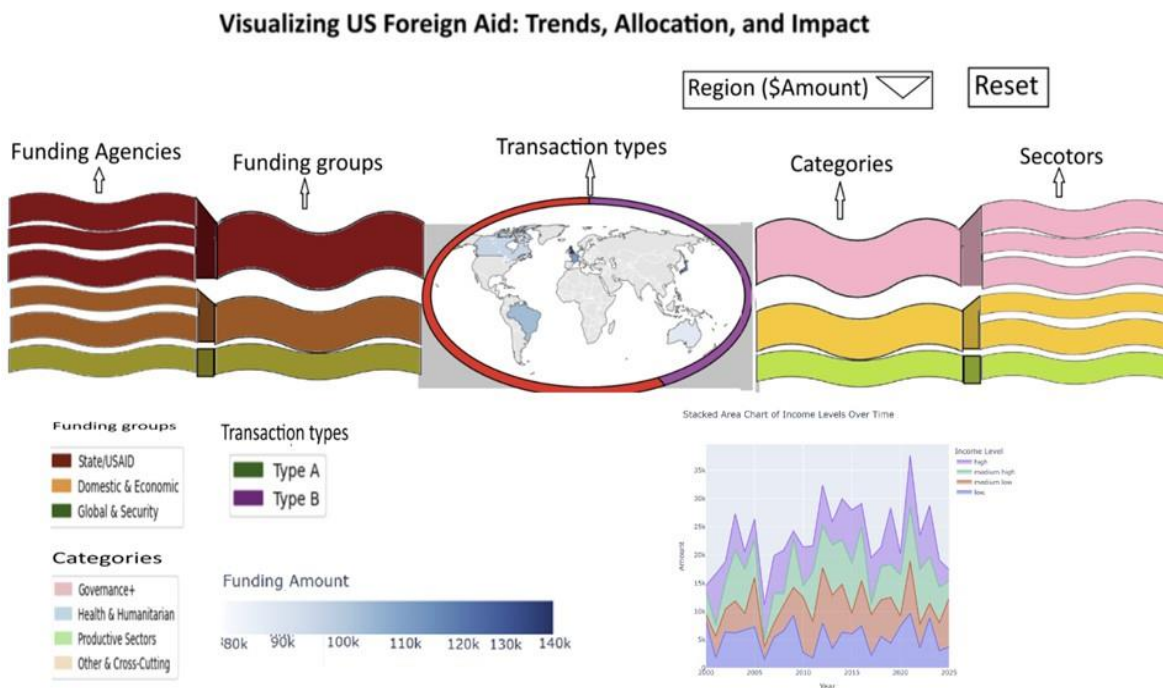
Task

How is U.S. foreign aid allocated across regions, funding agencies, categories, and transaction types, and how have these patterns shifted over time across different income levels?

Information

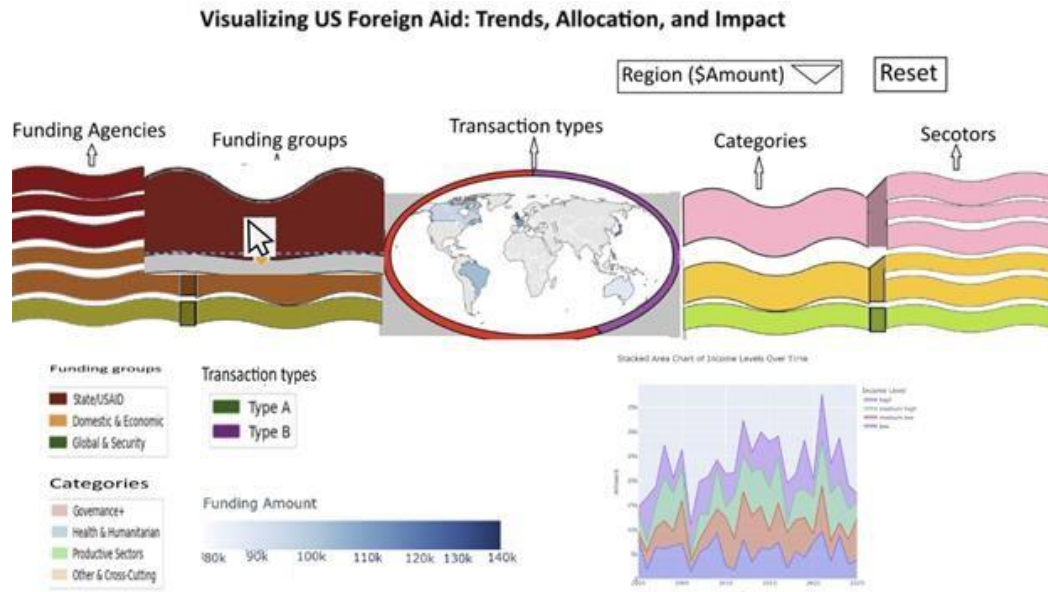
This interactive dashboard visualizes U.S. foreign aid trends, allocations, and impacts through an integrated interface combining Sankey charts, radial ring, a geographical map, and a stacked area chart. It allows users to explore funding flow across agencies, transaction types, regions, categories, and income levels over time.

Layout

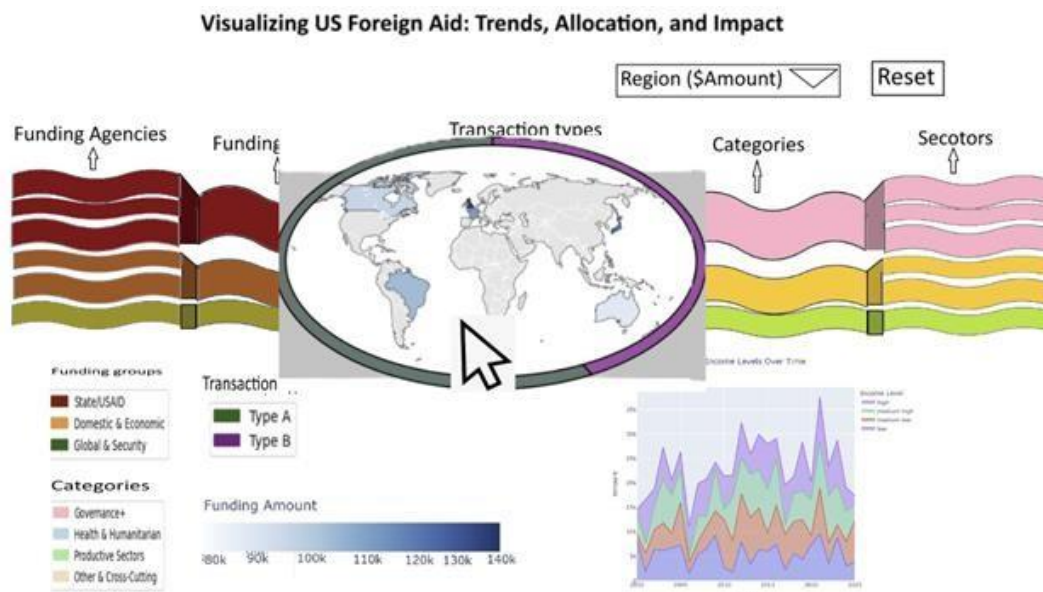


Focus

Click on a Funding Group



Click on a Geographical Map



Operations

- **Initial View:** Displays an aggregated global view showing total funding distribution across all components.
- **Hover on Funding Agencies:** Shows a tooltip with the agency's description.
- **Click on a Funding Group:** Highlights and pops up the group; updates all connected charts (transaction types, map, categories, sectors, stacked area).
- **Region Dropdown Selection:** Zooms into the selected region on the map; updates funding distribution, related groups, agencies, categories, and the stacked area chart accordingly.
- **Click on Geographical Map:** Highlights and pops up to show detailed funding distribution by country.
- **Click on a Category:** Highlights and pops up the category; updates all related components like funding groups/agencies, transaction types, and the stacked area chart.
- **Hover on Sectors:** Shows a tooltip with the sector's description.
- **Reset Button:** Reverts the entire visualization back to the original aggregated state.

Details

I. Dashboard

- **Global Funding Overview:** Presents a comprehensive summary of funding distribution across agencies, categories, regions, and sectors. Serves as the foundation for interactive exploration and filtering.
- **Temporal Trend Visualization:** Shows a stacked area chart of year-wise funding trends by income level.

II. Dataset Manipulations

Purpose: Reduce visual clutter, clarify institutional roles, and improve interpretability in Sankey flows.

1. Funding Agencies Consolidation:

- Original dataset had 18 individual U.S. federal departments/agencies.
- Agencies were grouped into **3 broad categories and 9 sub-categories** based on mission and funding style:

Agency Group	Funding Sub Group	Funding Agency Names
Defense & Strategic Development	Defense Department	Department of Defense, Department of the Air Force, Department of the Army
	Labor & Interior	Department of Labor, Department of the Interior
	Strategic & Investment	Millennium Challenge Corporation, Overseas Private Investment Corporation, Peace Corps, U.S. International Development Finance Corporation
Diplomatic & Direct Aid	State & USAID	Department of State and U.S. Agency for International Development
Economic & Technical Assistance	Agriculture & Food	Department of Agriculture
	Development Foundations	African Development Foundation, Inter-American Foundation, Trade and Development Agency
	Energy & Environment	Department of Energy, Environmental Protection Agency
	Health & Human Services	Department of Health and Human Services
	Treasury & Finance	Department of the Treasury

2. Category Consolidation:

- Original categories were fragmented across 9 thematic areas with overlapping sectors.
- Reorganized into 4 **functional super-categories** and 11 **sub categories** based on thematic alignment and sector purpose:

Main Category	Sub-Category	Sectors
Governance & Administration	Administrative Costs	Operating Expenses, Program Design and Learning
	Conflict/Security	Conflict, Peace, and Security
	Government/Civil Society	Government and Civil Society
	Social Infrastructure	Other Social Infrastructure and Services
Health & Humanitarian	Health Core	Basic Health, HIV/AIDS, Health, General, Maternal and Child Health, Family Planning, Water Supply and Sanitation
	Humanitarian	Disaster Prevention and Preparedness, Emergency Response
Other & Cross-Cutting	Education	Basic Education, Education, Level Unspecified, Post-Secondary Education
	Other	Action Relating To Debt, General Environmental Protection, Other Multisector, Unallocated/Unspecified
Productive Sectors	Agriculture	Agriculture
	Economic Growth	Banking and Financial Services, Business and Other Services, Trade Policy and Regulations
	Infrastructure	Energy, Transport and Storage

III. Color Assignment for Clarity

- Used **Tableau10 Categorical Palette** for Funding Groups and Categories for distinguishable visual identity.
- **Magma Sequential Palette** for Income Levels, ideal for ordered data (low to high).
- Transaction Types were given two **contrasting colors (Red/Yellow)** to visually differentiate interaction types.
- **Blues (Sequential) Palette** for funding amount distribution in Geospatial Funding Map.

Visual Component	Palette Type	ColorScheme
Funding Groups	Categorical (Tableau10)	Orange, Coral Red, Teal
Categories	Categorical (Tableau10)	Green, Golden Yellow, Pink, Brown
Transaction Types	Categorical	Red, Yellow
Income Levels (Time Series)	Sequential (Magma)	Violet to Gold gradient
Geospatial Funding Map	Sequential (Blues)	Blue gradient to represent funding distribution across countries/regions

IV. Metadata Enrichment

- **Tooltips:** Hovering over visual elements (e.g., funding agencies, sectors) reveals detailed breakdowns, including funding amounts and their categorization by sector/agency.
- **Color-Coding for Clarity:** A color scheme will visually distinguish between different categories (sectors/agencies) for easier data interpretation.
- **Data Granularity:** Users can drill down from a high-level view to more specific details by interacting with different components of the visualization.
- **Handling Null Income Levels:** Any records with missing income level names are treated appropriately and attributed to the region "World" for clarity and completeness.

Additional Resources

1. GitHub - <https://github.com/MSufiyanAG/U.S.-Global-Funding-Dashboard>

- Contains raw and manipulated data.
- Python notebook of manipulation.
- Project proposal

Prototype – Observable, Zip submitted alongside.

Notebook Link - <https://observablehq.com/d/dbdf02e94e85c8ba>