

**MODULE 7:**

# Data analysis and presentation

Only data that has been robustly collected, managed and carefully analysed can lead to accurate conclusions and inform a decision-making process. What and how to measure is important to get results that are informative and significant to the right people to drive policy dialogue forward.

**OBJECTIVE**

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Create different output formats, for example Sankey diagrams, pie charts or tables for qualitative and quantitative analysis.

**KEY QUESTIONS**

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- 7.1 What are the key quantitative and qualitative analytical questions to consider?
- 7.2 What visualisations can be helpful and constructive?
- 7.3 What to do if results are not consistent with other sources, controversial or limited?

## 7.1 What are the key qualitative and quantitative analytical questions to consider?

The qualitative and quantitative analysis links back to the objective and initial questions behind the land-use finance mapping (see Modules 1 and 4).

- ▶ What do we aim to achieve? What processes is the analysis going to inform?
- ▶ What should the numbers say?
- ▶ What do we want to measure? How do we measure it?

In most cases, it will be interesting to get an overview by quantifying the key dimensions of financial flows:

- ▶ How much did land-use related finance account for, in total, within the region and period of interest?
- ▶ Who provided the finance, and how much was provided?
- ▶ How much was delivered through each financial instrument?
- ▶ What were the main channels delivering land-use related finance?
- ▶ What sectors and activities was the money for?

In a second step, the spotlight might be on the financial flows, which will differ between actors. Some flows and levels of finance might be unexpected, and further analysis will be needed to find out why:

- What financial instrument(s) do actors/sources of finance prefer for each type of finance (climate-aligned/misaligned/conditional)? This usually includes budget expenditure for government actors, or grants/loans for international development partners.
- Which channel(s) do actors/sources of finance deliver most money through for each type of finance? For example, government might channel mostly via technical ministries/public agencies, while international development partners channel through a diverse set of actors.
- What sector(s)/use(s) do actors/sources of finance focus on? For example, government spends most climate-aligned finance on enabling environment setup, while international development partners focus on adaptation activities.

Comparisons and ratios will be helpful to provide context, show progress, reveal bottlenecks, and so forth (see Table 11). These calculations could be undertaken:

- Per actor, for example to compare the engagement of, or challenges to, domestic vs. international, or public vs. private.
- Per year, for example to track progress between years.
- Per province, for example to reveal a potential influence of provincial policy/economic environments.
- Per target sectors or uses, to compare resources dedicated to different policy objectives and coherence between policy objectives and resources.

When data is consolidated in a spreadsheet, built-in functions can help to calculate these ratios and manipulate the data in several different ways, including by filtering data, summing it up, or creating pivot tables.

Quantifying financial flows and ratios will show where further analysis is needed, where initial questions need to be revised, and where others could potentially have objections. As a result, more information and data might be needed to feed into this additional analysis/revised research questions (see Module 5 on data collection).

In addition, financial mapping analysis can also offer more qualitative analysis on the role of certain actors, financial mechanisms or intermediaries.

Comparison/ratio	Interpretation	Challenges
Ratio: Total economy-wide investment vs. total land-use sector investments	Provides context by revealing the importance of the land-use sector compared to other policy areas or sectors of the economy	
Outliers: Disproportionally high/low value for: <ul style="list-style-type: none"> <li>• Instruments</li> <li>• Channels</li> <li>• Sectors or policies and measures</li> </ul>	Indicates opportunities for delivering additional finance or current challenges	Subject to further analysis
Finance received (flowing in) does not equal finance delivered (flowing out). Might be interesting for evaluating: <ul style="list-style-type: none"> <li>• Instruments</li> <li>• Intermediaries or channels</li> </ul>	Reveals bottlenecks	Subject to further analysis
Ratio of land-use sector finance that is climate-aligned vs. climate-misaligned or conditionally-aligned	Shows where REDD+ objectives/ safeguards have already been considered and where they have not Shows the advance in terms of REDD+ planning and resource mobilisation	Could face some political resistance
Ratio of climate-aligned land-use finance delivered in total vs. delivered through key programme(s)	Shows influence of/reliance on key programme(s) as compared to other activities Underlines the importance of ensuring that these programme(s)/ activities provide the right incentives for forest owners to adopt sound forest management practices, and of monitoring their impacts	Might be biased, since data/ information for important programmes might be more readily available than for less streamlined activities, where data might be scattered across different data sources
Amount spent per objective or focus area of a REDD+ or similar strategy compared to objectives	Reveals bottleneck or potential for additional funding	Need further analysis on the rationale, for example resources requested from national budget not granted, because no budgetary priority
Ratio of climate-aligned land-use finance: <ul style="list-style-type: none"> <li>• Planned/estimated vs. disbursed</li> <li>• Contribution of different sources of finance and/or instruments in financing specific policy objectives</li> <li>• Revenue generated from land use as a percentage of total government budget</li> </ul>	Reveals bottlenecks or re-prioritisation of budgets Reveals which sources of finance are important and could be further mobilised if funding transfers (for instance between national and local governments) are effective Shows the importance of specific land uses for the economy	Subject to further analysis



**Table 11:** Possible dimensions for data analysis and interpretation

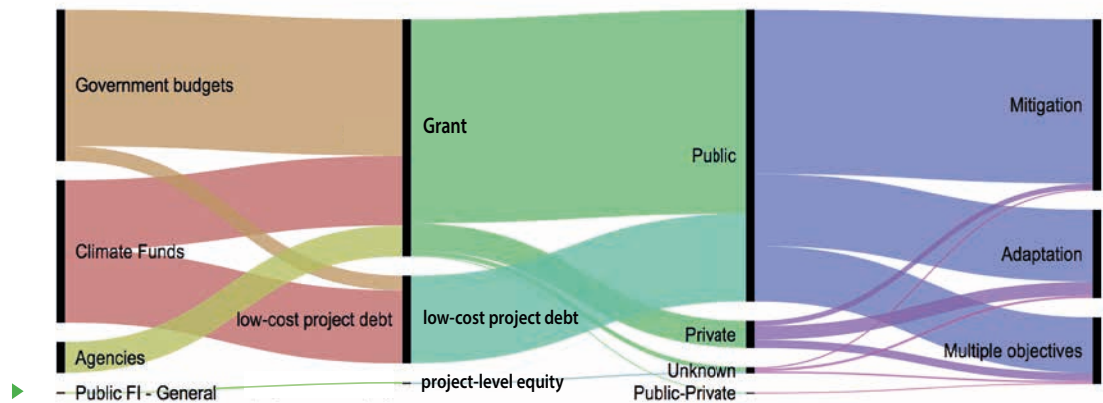
## 7.2 What visualisations can be helpful or constructive?

Aggregate analyses are often presented in either tabular format or via a Sankey diagram. Additional visualisations can help shed light on certain aspects of the land-use finance analysis.

### 7.2.1 Sankey diagram

A Sankey diagram visualises the magnitude of flows between different categorical dimensions. The flows are displayed as lines with thickness proportional to the quantity of flow—smaller flows have thinner lines—and each categorical node’s height is determined from the sum of the flows entering and exiting that node.

Figure 12: Example Sankey diagram showing financial flows from sources, through instruments, disbursement channels, to uses



Different software providers offer tools to generate Sankey diagrams. Some pieces of software are free, while others have a subscription fee. The following table compares three pieces of software that have been used in the context of finance landscapes.

Table 12: Comparison of three pieces of Sankey software

	<b>RAWGraphs</b>	<b>e!Sankey</b>	<b>Sankey Flow Show</b>
<b>Provider</b>	Density and Calibro <a href="http://www.rawgraphs.io">www.rawgraphs.io</a>	iFU Hamburg <a href="http://www.ifu.com/en/e-sankey">www.ifu.com/en/e-sankey</a>	Thortec <a href="http://www.sankeyflowshow.com">www.sankeyflowshow.com</a>
<b>Level of customisation of the visualisation tool</b>	Standard design Does not allow freely adding text, nodes and dimensions, or images onto the Sankey	Allows drawing own nodes and dimensions, size, position and flows Allows adding text, title and images Allows changing shapes and colors	Allows drawing own nodes and dimensions, size, position and flows Allows adding text, title and images Allows changing shapes and colors
<b>Type of tool</b>	Online, open source	Offline	Online
<b>Allows segregating flows (for example, green vs. grey)</b>	No	Yes	Yes
<b>Dataset complexity</b>	Suitable for small and simple datasets No extra complexity to flows can be added	Suitable for large and complex datasets Allows for different layers of information to be illustrated	Suitable for large and complex datasets Allows for different layers of information to be illustrated
<b>Live link to Excel data</b>	No	Yes	No
<b>Language availability</b>	Training material and user interface in English	Training material in English User interface in English, French, Spanish, Portuguese and German	Training material and user interface in English
<b>Price</b>	Free	Yearly fee Three versions available We recommend the Pro version, EUR 480 + VAT Trial version available	Yearly or monthly fee Two versions available Pro version EUR 41.88 + VAT per year Free restricted version available

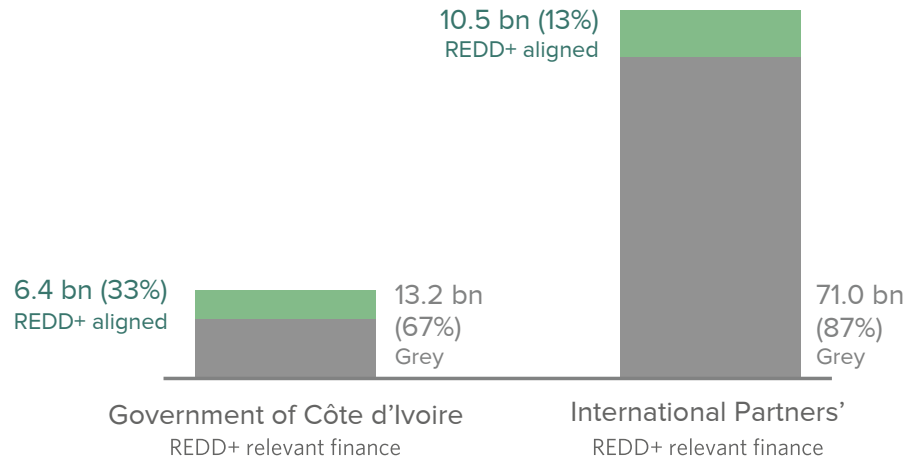
Annex II provides [detailed guidelines on how to create a Sankey diagram](#) using the RAWGraphs and e!Sankey softwares.

### 7.2.2 Other visuals

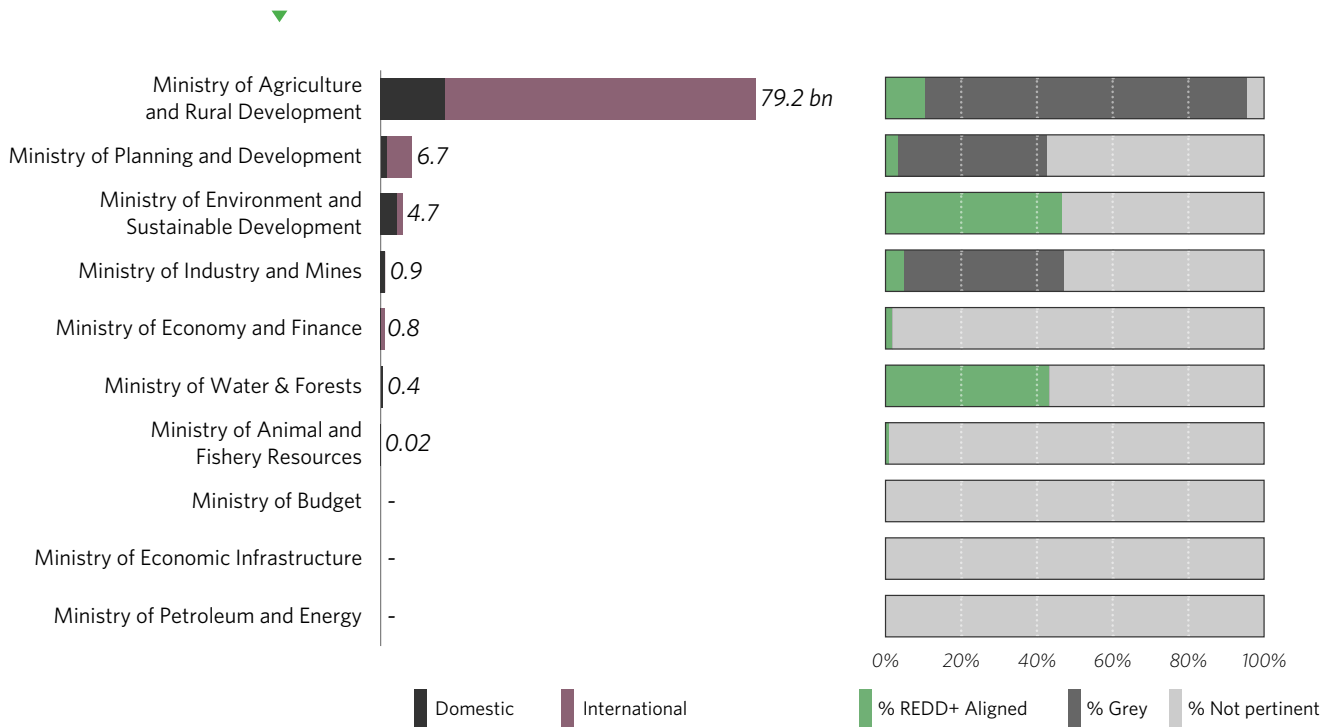
Other visuals that could be constructive to visualise comparisons, ratios or other insights include:

**Bar/pie charts** are a simple, easy-to-implement way to visualise ratios, for example split between REDD+ aligned and grey finance contributed by different actors/to different sectors.

**Figure 13:** Bar chart showing how much 'REDD+ aligned' finance and how much 'grey' finance government and international partners each provided (Source: Falconer et al., 2017) ▶

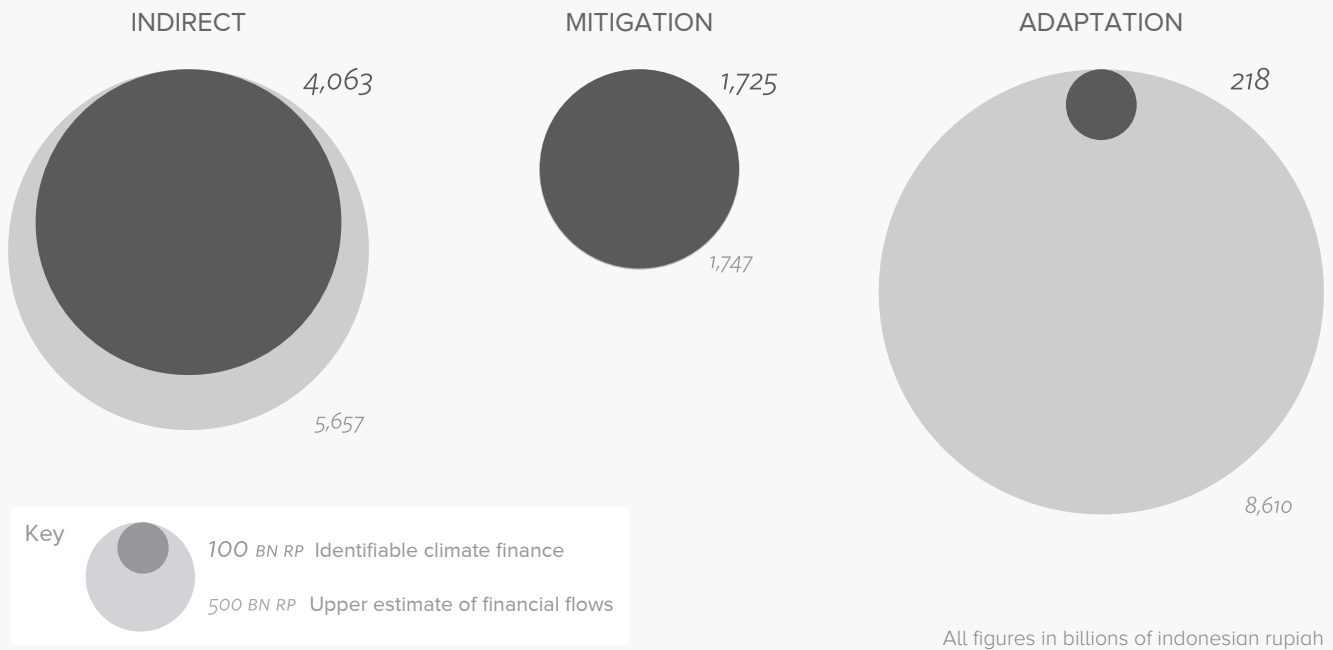


**Figure 14:** Bar chart showing, for each ministry, where the finance delivered originates from (domestic/international) and how it was used (REDD+ aligned/grey) (Source: Falconer et al., 2017)



**Bubble charts** may also depict ratios, for example climate-specific finance as a share of total potentially climate-relevant development finance.

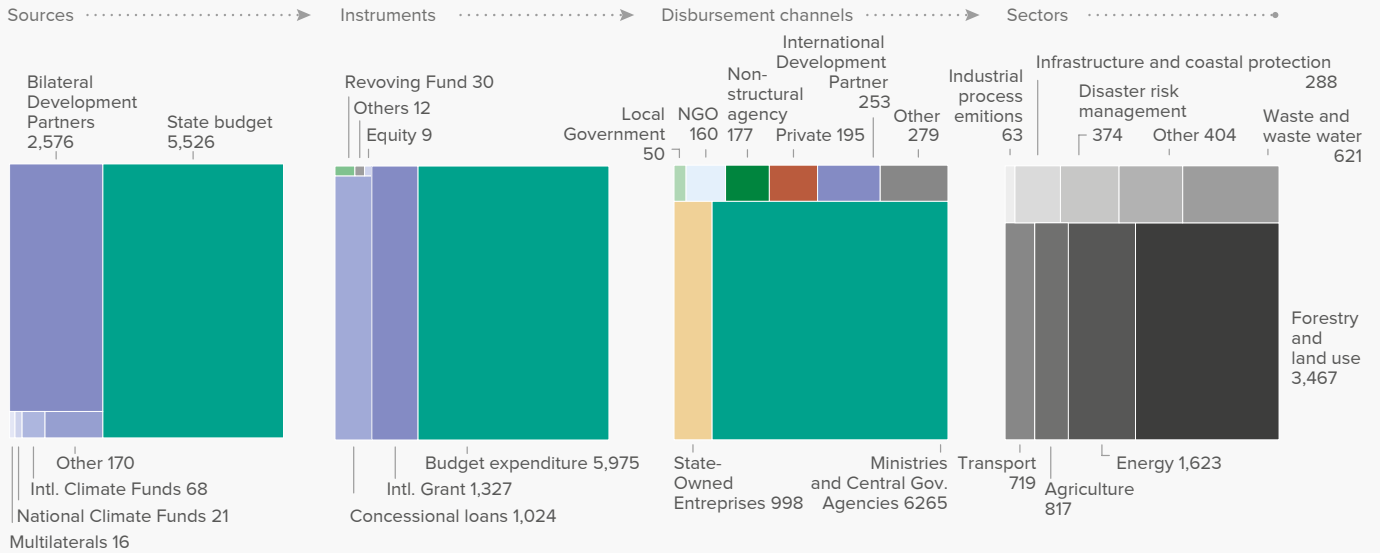
### Uses of public climate finance in Indonesia in 2011



**Figure 15:** Chart depicting the uncertainty in tracking 2011 public climate finance in Indonesia (Source: Ampri et al., 2014)

**Treemaps** can help visualise a more complex set of information, for example climate finance by sources, instruments, disbursement channels and sectoral uses, while using colours to represent financial contributions of different sets of actors, for example international public in blue, domestic public in green and so forth.

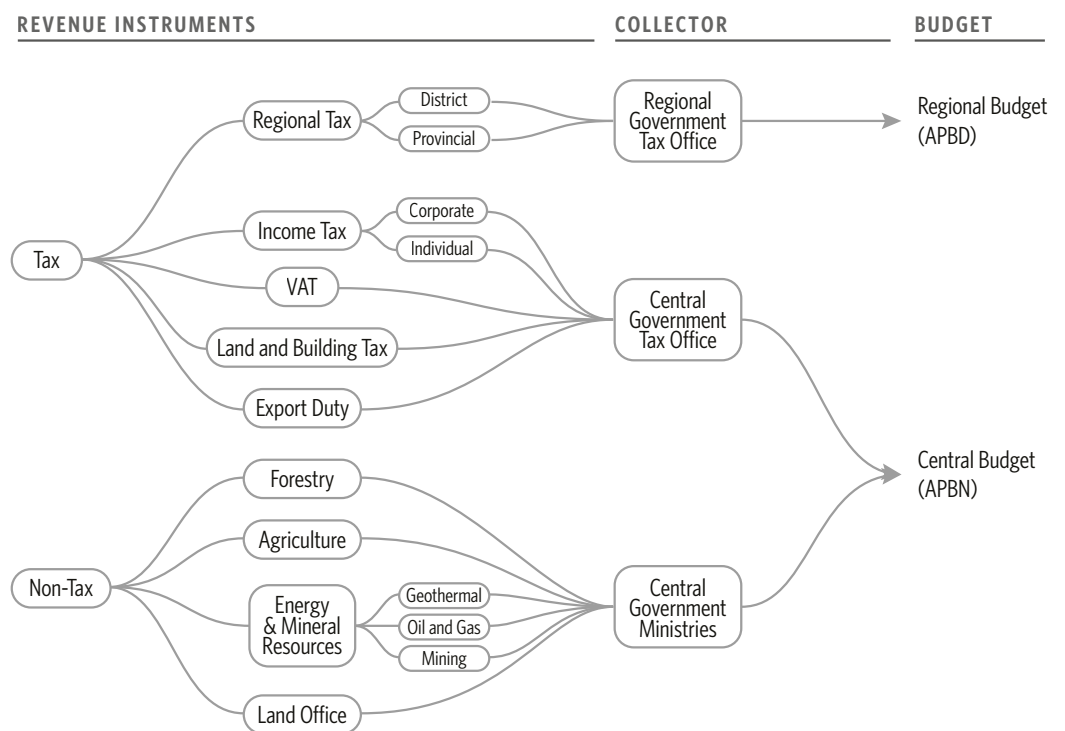
### Public climate finance flows in indonesia in 2011



All figures in billions of Indonesian rupiah (IDR)

**Figure 16:** Treemaps showing a simplified breakdown of public climate finance flows in Indonesia in 2011 (Source: Ampri et al., 2014)

If there is no quantitative data available, or if numbers would distract the audience from the statement or process to be substantiated by a chart, a flowchart can be useful.



**Figure 17:** Qualitative analysis of revenue instruments related to the land-use sector in Indonesia (Source: Mafira and Sutyono, 2015)



## 7.3 What to do if results are inconsistent with other sources, controversial or limited?

In most cases, consultants and/or technical staff will be responsible and/or help with analysing the data. Before proceeding with the development of policy recommendations based on the results of the analysis, they should evaluate them against the following questions:

- ▶ Will the analysis results help answer the original question? How?
- ▶ Are they consistent with other sources or politically controversial? Why?
- ▶ Does the data help to defend against any objections? How?
- ▶ Are there any limitations on the conclusions, any unconsidered angles?

As analysis results form the basis for the development of policy recommendations, it is advisable to reach out and discuss the results with advisers of those organisations that are financing or implementing the land-use activities being analysed. This is especially important if consolidated numbers do not add up to an 'official' number, could be controversial or have limitations. Further, stakeholder engagement is needed to find reasons for the discrepancy and/or controversy, to discuss implications and benefits of policy recommendations based on such numbers, and to agree on further proceeding (see Module 2 for potential formats). For example, budget analysis can be politically sensitive. In particular, an aggregate expenditure figure can be sensitive. Some countries may be reluctant to report a figure that is considered to be too low. Here, careful messaging and communications are necessary to put numbers in context, highlighting where data was unavailable and therefore missing from the analysis.