GFOI Global Forest Observations Initiative

# The importance of uncertainties in forest monitoring

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Food and Agriculture Organization of the United Nations

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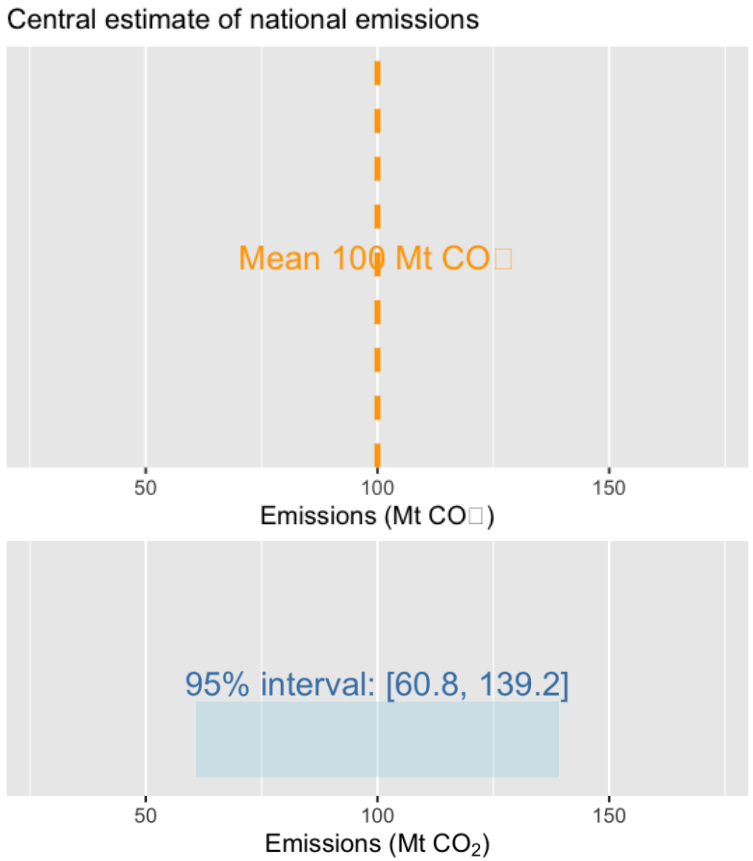
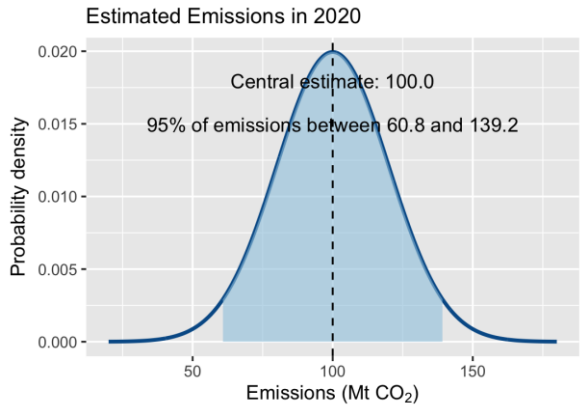
# Why uncertainty matters?

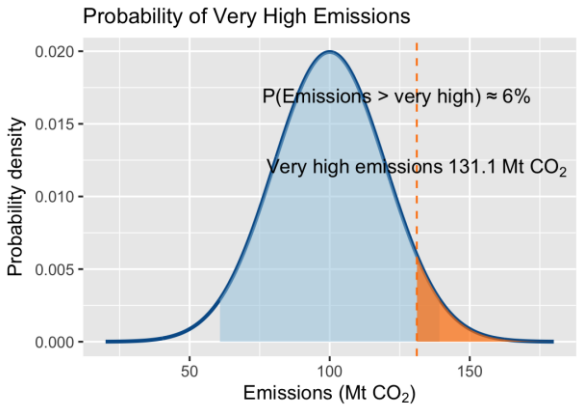

**Uncertainty isn’t noise — it’s information needed for credible emission reductions.**

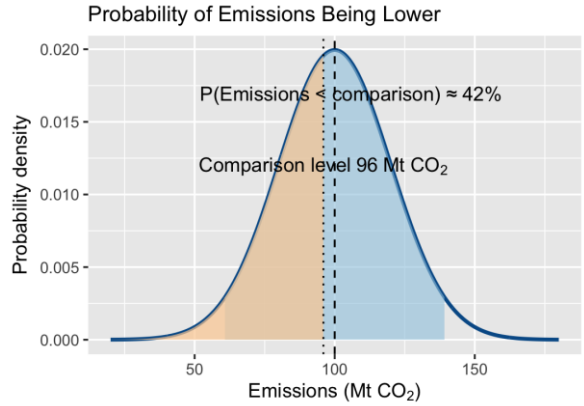
# Uncertainty is INFORMATION

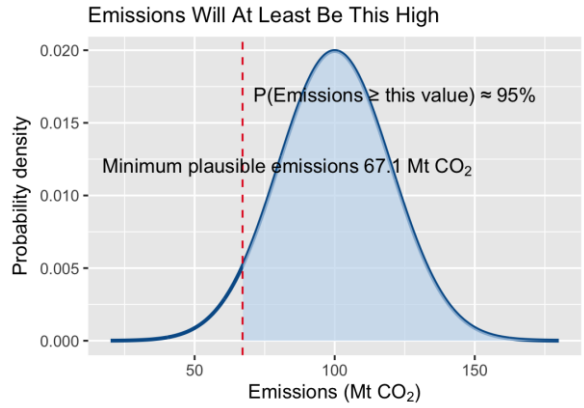



Uncertainty is INFORMATION: Probabilities



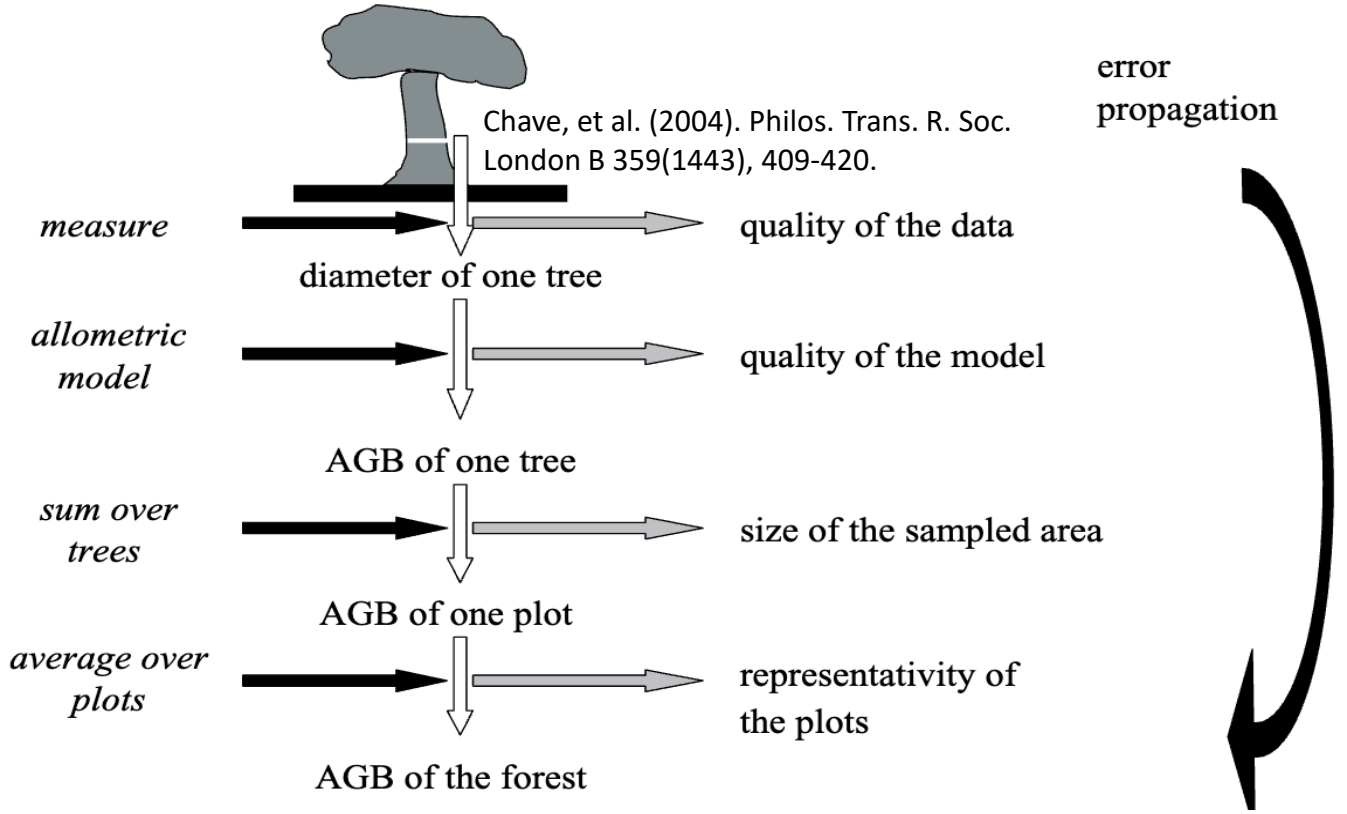



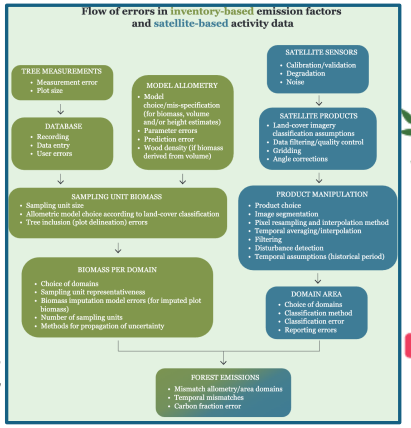



# How uncertainty propagates through forest monitoring

- Uncertainty compounds at every level, from tree measurement to national totals
- Different error types accumulate: measurement, model, sampling,..
- Understanding propagation is essential before interpreting emissions or reductions

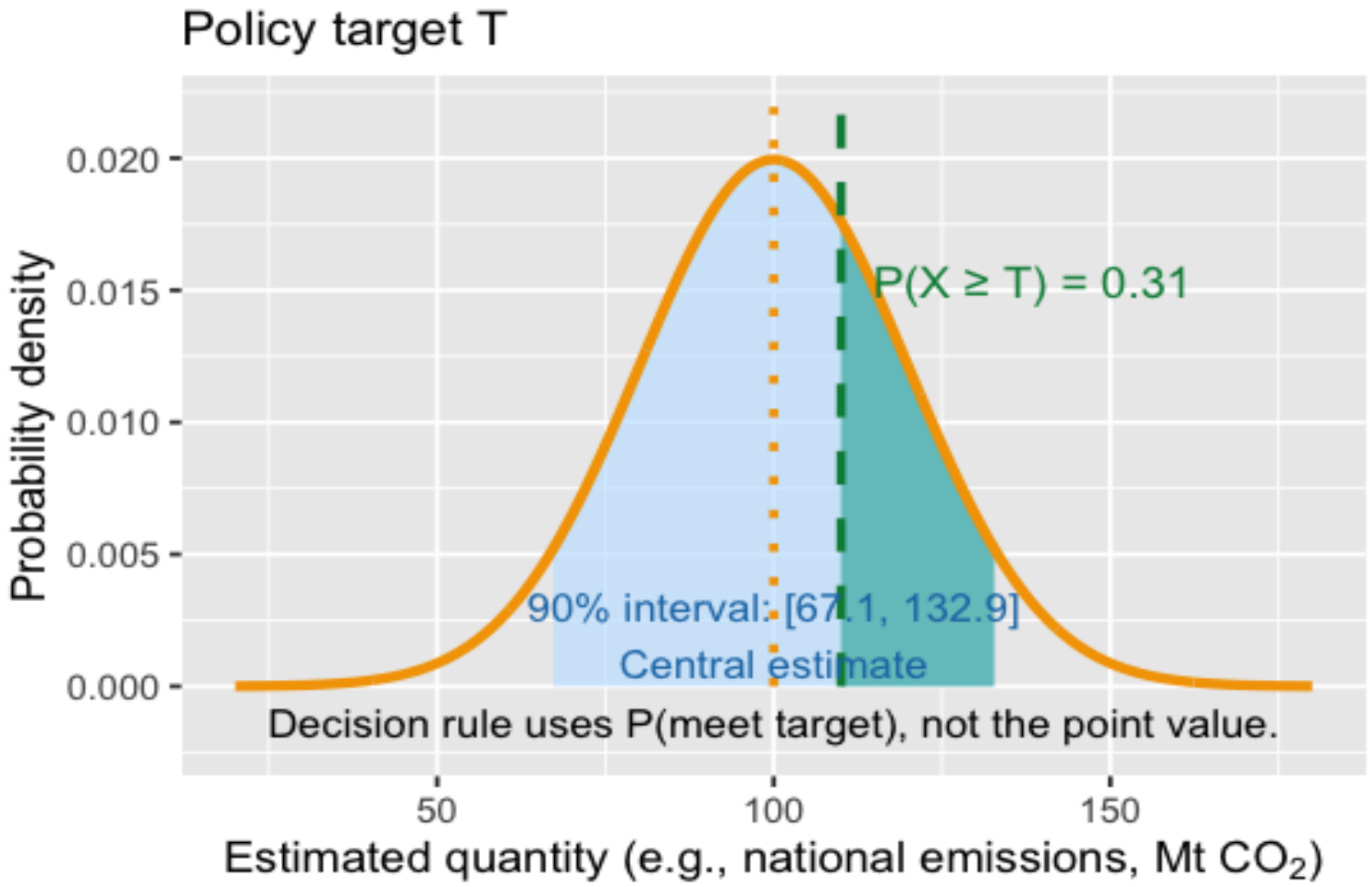



This is why emissions are **distributions**, not single numbers



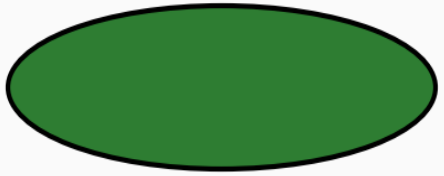
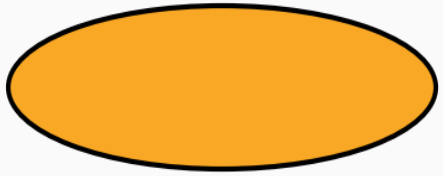
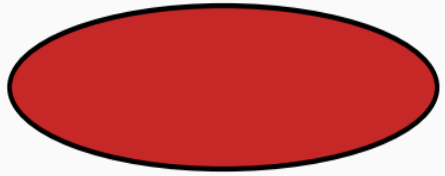

**Error sources**. FAO (2018). Working Paper 17

# From intervals to decision-relevant probabilities



# Decision rules for decision makers

## Simple “**traffic-light**” rule, editable for **countries**

| GREEN | AMBER | RED |
| --- | --- | --- |
|  |  |  |
| P(meet target) ≥ 0.80 | 0.60 – 0.80 | < 0.60 |
| Stay the course | Prepare/launch contingency | Activate Plan B |

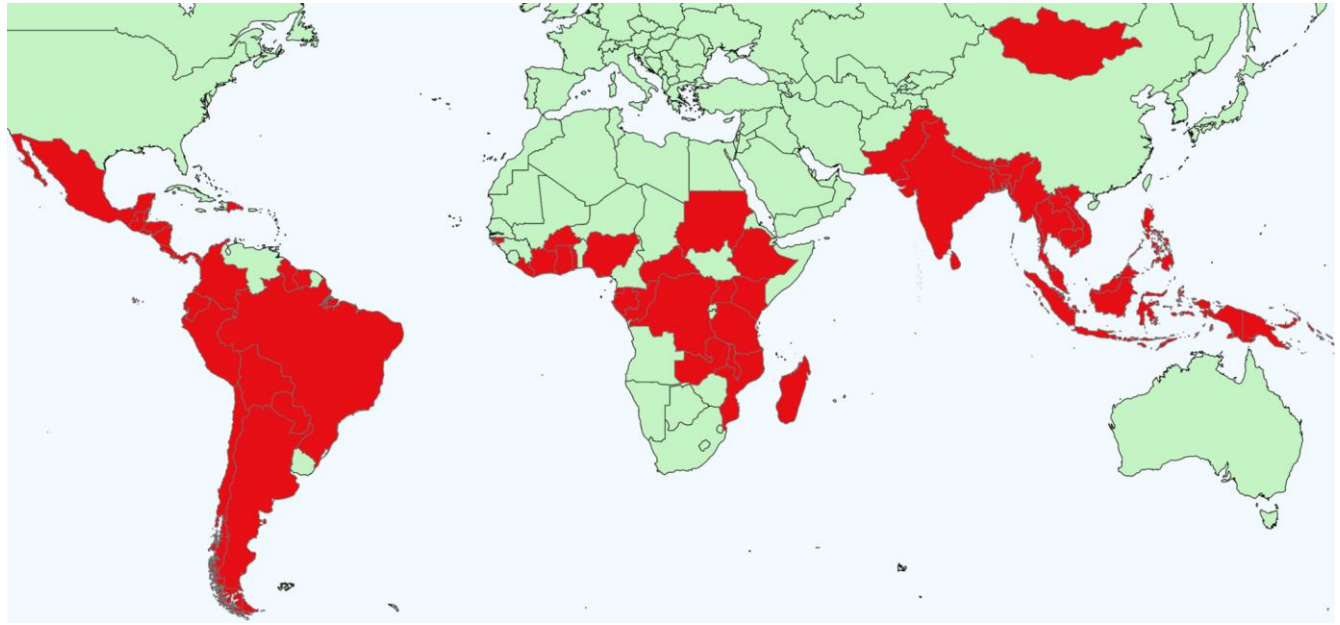
Risk rule: act on probability, not point estimates

# International status of uncertainty reporting

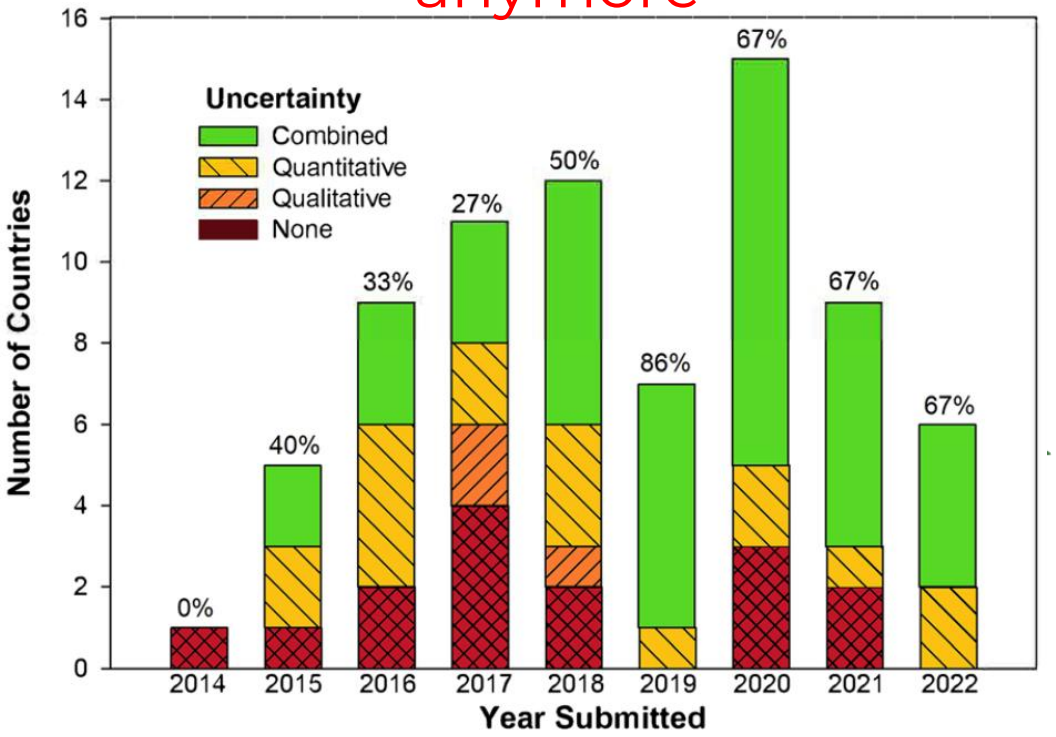
## Uncertainty in REDD+ carbon accounting: a survey of experts involved in REDD+ reporting

Brett J. Butler[1], Emma M. Sass[2], Javier G. P. Gamarra[3], John L. Campbell[4], Craig Wayson[5], Marcela Olguín[6], Oswaldo Carrillo[6] and Ruth D. Yanai[7*]

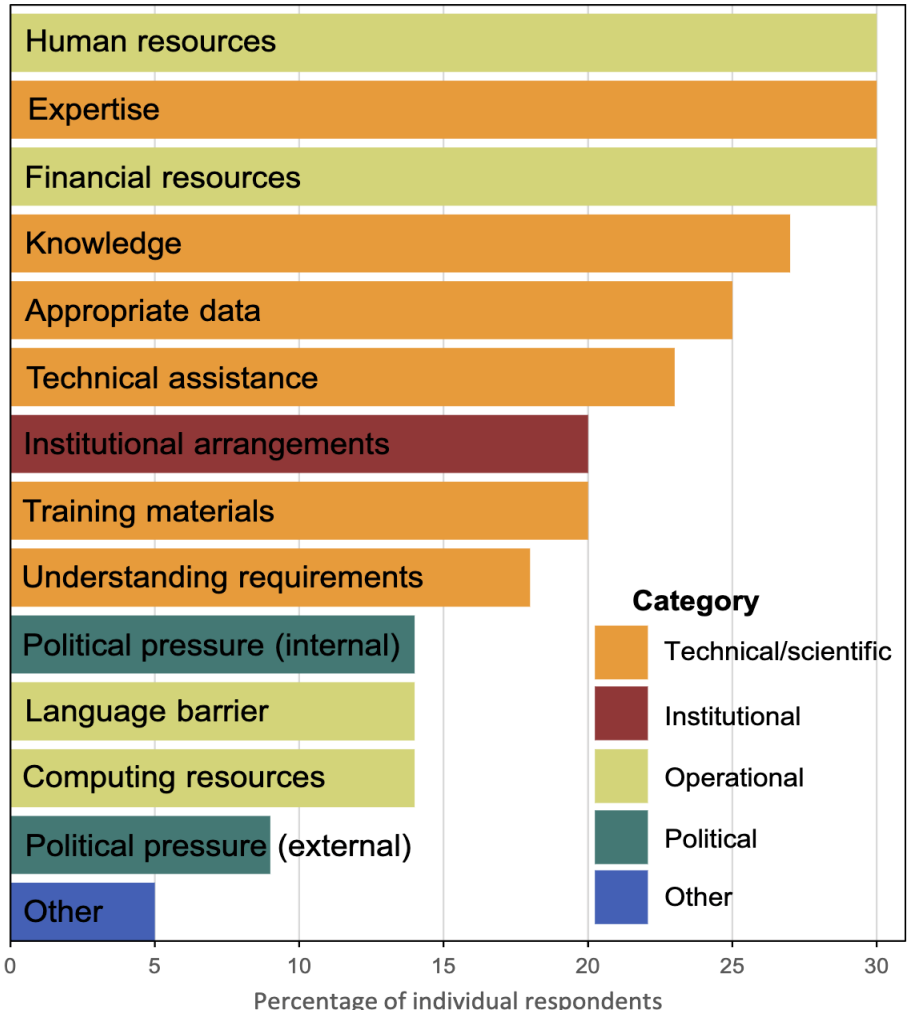
Source: Butler *et al* (2024) *Carbon Balance Manag.* **19:** 22.



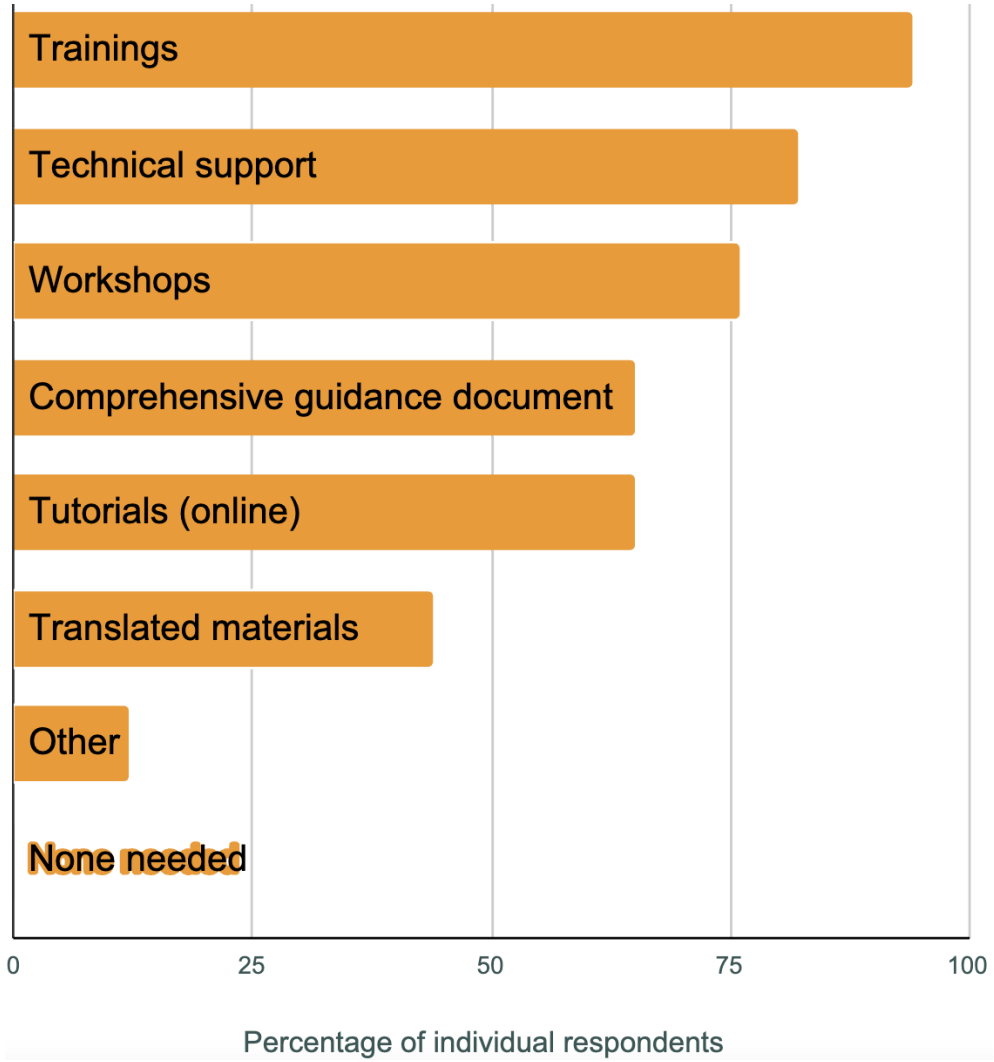
Not reporting uncertainties seems not an option anymore



# Obstacles



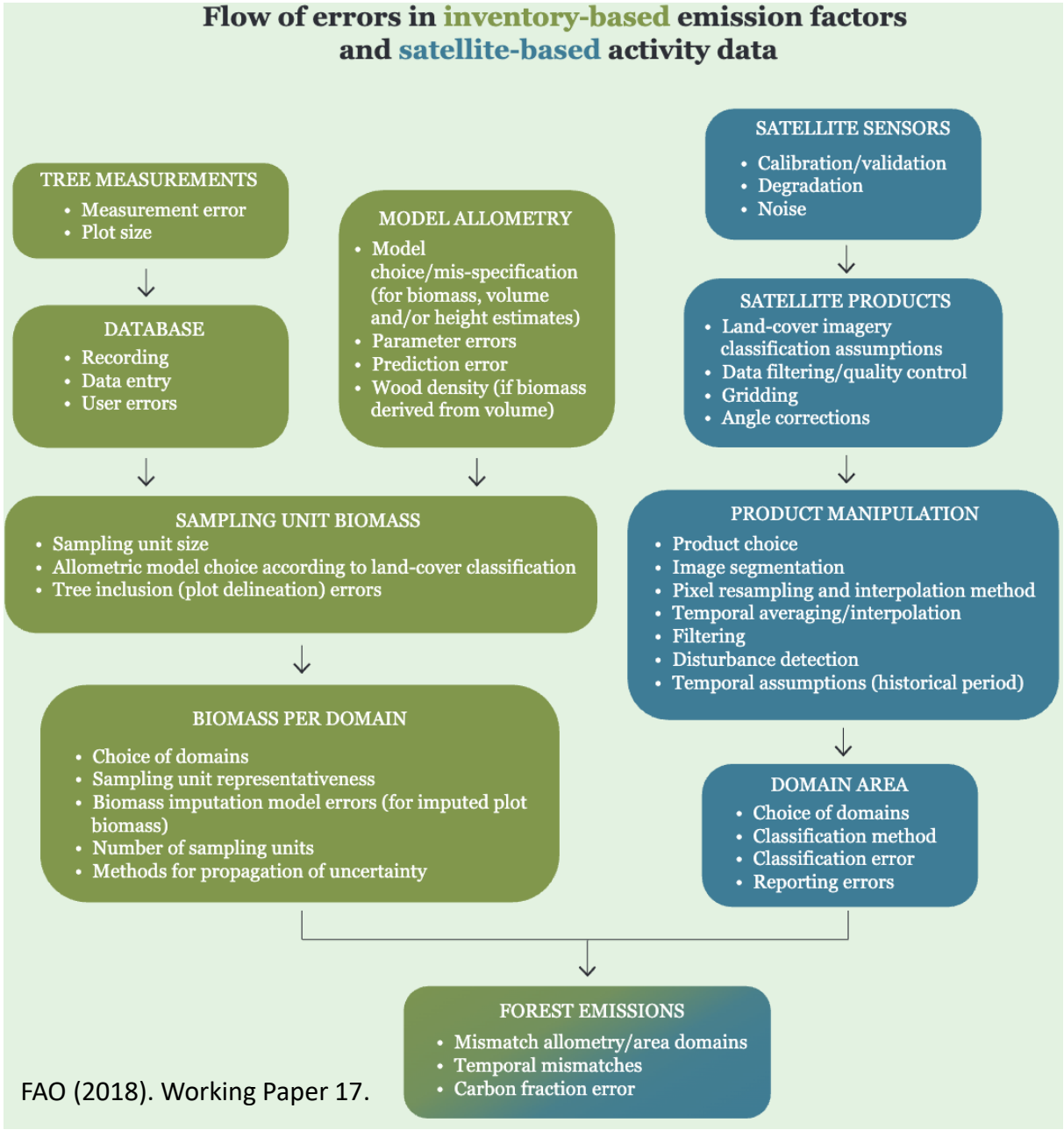

# Needs



Looking at uncertainties as probabilities we link ‘actions’ to **reducing decision risk,** based on **uncertainty information**

# Thank you

# Additional detail on error sources




FAO (2018). Working Paper 17.