FAO's work on National Forest Monitoring System and MRV for REDD+

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FAO and its role in REDD+

❑ **FAO's key role in REDD+ readiness is to help countries develop, implement and operationalize their National Forest Monitoring System (NFMS)**

❑ **FAO also assists countries in conceptualizing and implementing REDD+ activities and in the development of policies and measures**

Key principles of FAO's support

➢ National ownership
➢ Alignment with the UNFCCC process
➢ Step-wise approach that allows for improvement over time
➢ Builds upon existing capacities, available data and systems in place
➢ Use of open-source, freely available data and tools as much as possible
➢ Strengthening of national capacities (learning-by-doing)
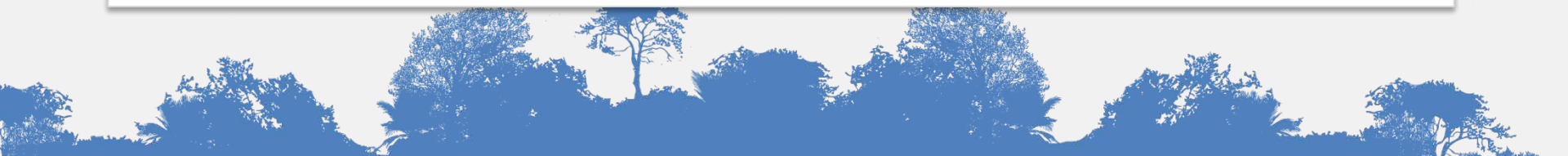
Basics of the UN-REDD Programme

- The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries

- FAO/UNDP/UNEP, launched September 2008

- Secretariat is located in Geneva, Switzerland

- To help countries and the international community gain experience with REDD, and to contribute to the UNFCCC process

- Coordination with other initiatives, e.g. FCPF, FIP, UNFCCC

- Activities are different levels: Global, Regional and National Programmes

UN-REDD Members in Africa

- 28 partner countries in the region
- 7 countries have been receiving National Programme support
  - DRC, Zambia, Tanzania, Congo, Nigeria, Ivory Coast & Uganda
- 23 countries have been receiving targeted support and 6 Country Need Assessments ongoing
- FAO / UN-REDD support through FCPF funding in Ethiopia and Uganda

Key work of FAO on REDD+ in the region

Satellite land monitoring unit in DRC

Webportal established in DRC and Zambia

Support to National Forest Inventory in Zambia, Congo , DRC and Tanzania

Drivers analysis in Zambia, Nigeria and DRC

Forest /land cover maps development and change analysis in Tanzania and Zambia, including training

Allometric equation database and field work in Zambia and Tanzania

Targeted support in Ivory Coast to enhance donors' coordination, support capacity building and initiate R-PP

Reference Levels guidance in Tanzania and Zambia

Analysis of NFI data to develop emission factors in Zambia

FAO's approach to NFMS and MRV for REDD+

Through the UN-REDD Programme, FAO published a guidance document on REDD+ National Forest Monitoring Systems (NFMS)*

NATIONAL FOREST MONITORING SYSTEM (NFMS)

MONITORING FUNCTION
- Remote Sensing
- WEB Interface
- Community Monitoring
- Other monitoring systems related to forest

MRV FUNCTION
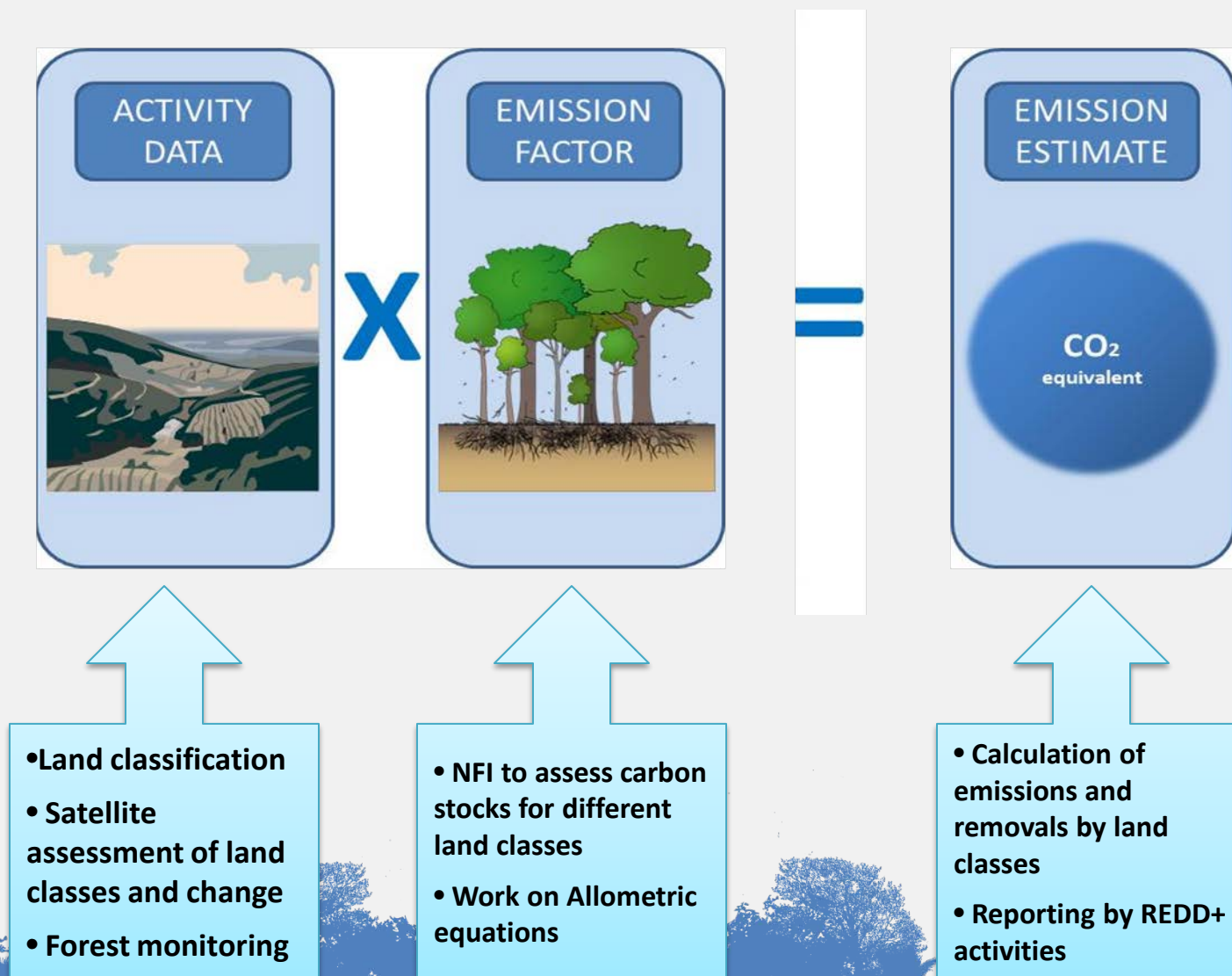- Satellite Land Monitoring System
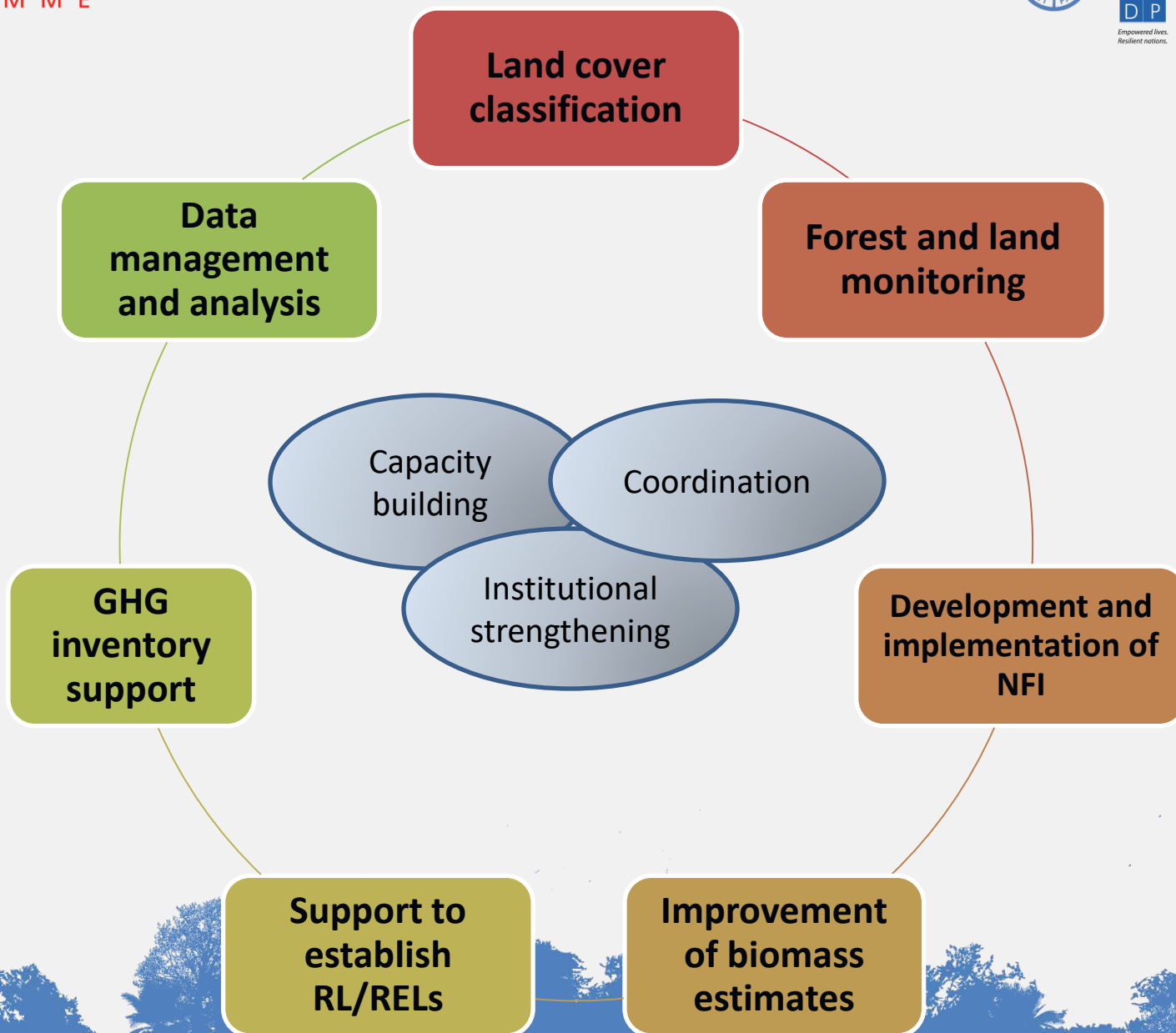- National Forest Inventory
- GHGs Inventory

System to provide information on Safeguards (SIS)

* http://www.un-redd.org/UNREDDProgramme/InternationalSupport/MeasurementReportingandVerification/tabid/1050/language/en-US/Default.aspx

The 3 MRV pillars in details

| ACTIVITY DATA | X | EMISSION FACTOR | = | EMISSION ESTIMATE (CO_2 equivalent) |

- Land classification
- Satellite assessment of land classes and change
- Forest monitoring

- NFI to assess carbon stocks for different land classes
- Work on Allometric equations

- Calculation of emissions and removals by land classes
- Reporting by REDD+ activities

FAO's support areas for REDD+ NFMS

# Support to develop land cover classification and trainings

- **UN-REDD has trained many other countries on LCCS3** (e.g. Bangladesh, Cambodia, Ethiopia, etc)

- **Training includes full coverage of LCCS and exercises:**

  - Land representation system to ensure compliance with IPCC Guidance and Guidelines; Status of country land cover maps and classification systems; FAO's land cover classification system, etc
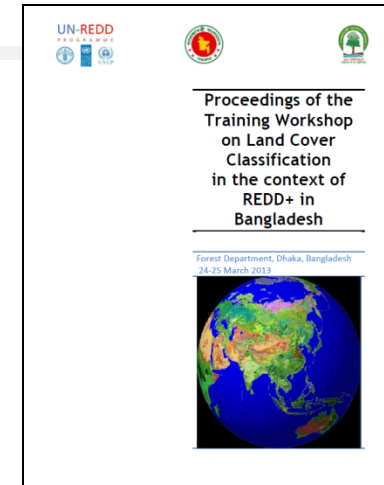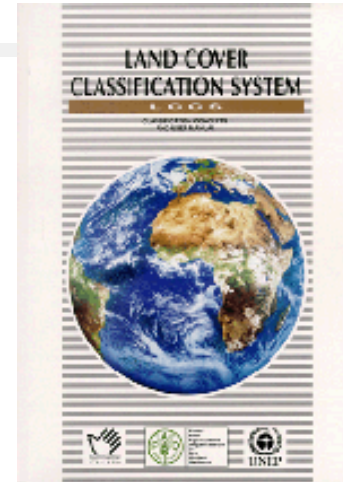
# Training and support on forest and land cover change assessment

- In-country support to update forest area and change in forest areas with statistical estimates of precision and accuracy assessment

  - Tailored for REDD+ (support to determine relevance/accuracy of time points, representativeness, etc)

- Assessment of existing historical land/forest cover maps

- Training in remote sensing methods and tools support, support for multi-source inventory using new tools (e.g. Google Earth), biomass estimates, etc.

- Support provided to many UN-REDD countries, including **Ecuador, Uganda, Tanzania, Paraguay, South Sudan, Panama, Laos**

Global Forest Resources Assessment 2010
Main report

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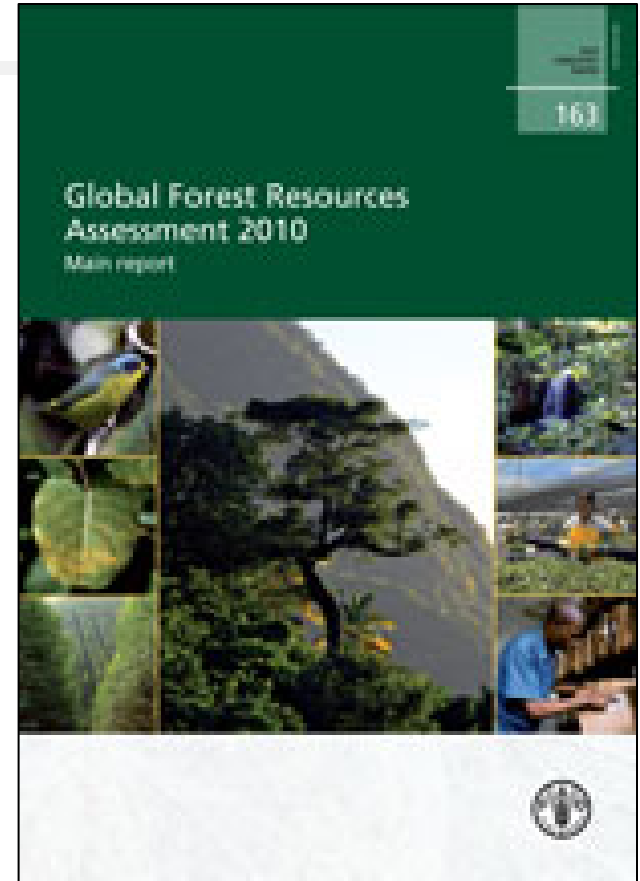
Development of satellite forest monitoring systems and portal units for REDD+ countries

- FAO has developed partnership with INPE (Brazil) to tailor TerraAmazon system in other REDD+ countries

- Allow countries to update and display forest cover map using LandSat data rotation based on PRODES

- FAO implements similar systems in DRC, PNG, Paraguay, Zambia, etc

- Combination of free software packages, open-source database, user interface, tools and algorithms adapted according to country needs
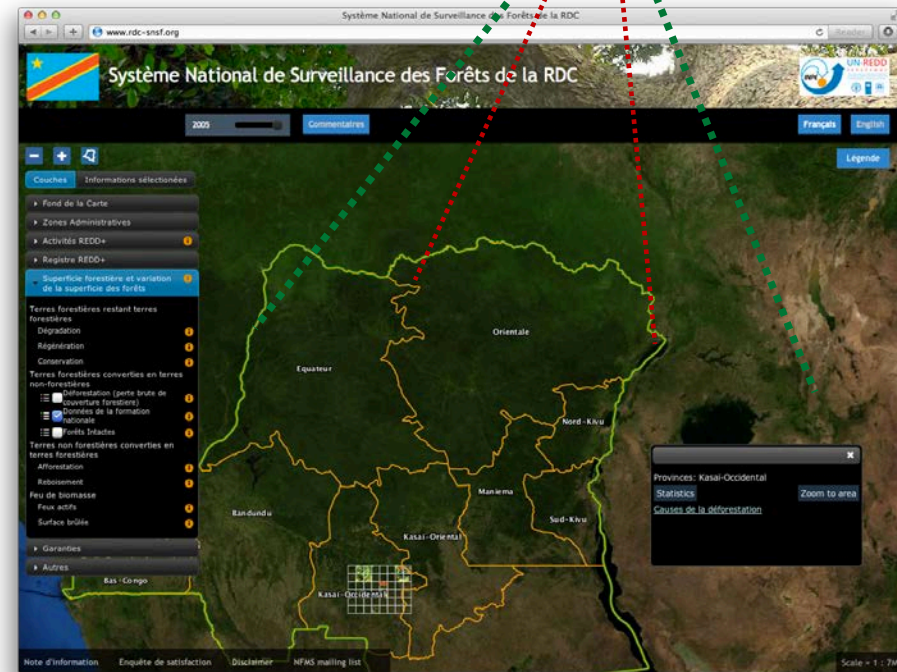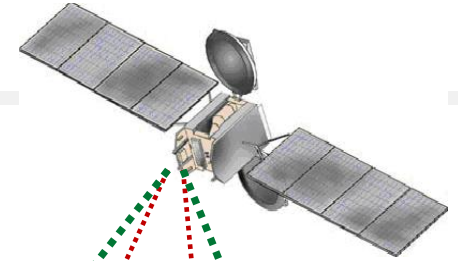
DRC portal available at: www.rdc-snsf.org

Design and implementation of NFIs for REDD+

FAO is currently supporting Tanzania, Zambia, Ethiopia, Angola, Congo and many others with their national forest inventory :

- Systematic sampling over national territory with potential intensification in forest areas

- Use of ongoing land cover classification and Google Earth tools developed by FAO for optimized sampling

- Sampling of key carbon pools for REDD+ , including soil carbon

- Socio-economic survey can be tailored for collecting information on safeguards

- New allometric equations could be developed to improve biomass estimates

- Suite of free software tools (Open Foris) to easily collect, check, calculate, analyze and store data

http://www.fao.org/forestry/fma/openforis/en/

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Development of new allometric equations and maintenance of global database

- FAO has created and updates an allometric equation database containing more than 4000 equations

- Database is composed by 71 variables related to plant ecology, population, geographical localization, ecological zones, equation parameters, etc

- UN-REDD provides support to improve national biomass estimates with new AEs in Tanzania, Zambia, Vietnam, Ecuador, Philippines, etc

ID	Ecosystem	Country	Biome	Species	Output
411	Forest	Botswana	Tropical dry forest	Baikiaea plurijuga	volume
416	Forest	Botswana	Tropical dry forest	Burkea africana	volume
417	Forest	Botswana	Tropical dry forest	Colophospermum mopane	volume
429	Forest	Botswana	Tropical dry forest	Pycnanthus angolensis	volume
487	Forest	Botswana	Tropical shrubland	All All	volume
570	Forest	Botswana	Tropical shrubland	Acacia erubescens	fresh biomass
571	Forest	Botswana	Tropical shrubland	Acacia karoo	fresh biomass
572	Forest	Botswana	Tropical shrubland	Acacia mellifera	fresh biomass
573	Forest	Botswana	Tropical shrubland	Acacia tortillis	fresh biomass
588	Forest	Botswana	Tropical shrubland	Dichrostachys cinerea	fresh biomass
603	Forest	Botswana	Tropical shrubland	Ziziphus mucronata	fresh biomass
646	Forest	Botswana	Tropical dry forest	Acacia tortillis	biomass
647	Forest	Botswana	Tropical dry forest	Colophospermum mopane	biomass
721	Forest	Botswana	Tropical shrubland	Acacia erioloba	biomass
722	Forest	Botswana	Tropical shrubland	Acacia erubescens	biomass
723	Forest	Botswana	Tropical shrubland	Acacia karoo	biomass
724	Plantation	Botswana	Tropical shrubland	Acacia karoo	biomass
725	Forest	Botswana	Tropical shrubland	Acacia luederitzii	biomass
726	Forest	Botswana	Tropical shrubland	Acacia mellifera	biomass
727	Forest	Botswana	Tropical shrubland	Boscia albitrunca	biomass
745	Forest	Botswana	Tropical shrubland	Acacia tortillis	biomass

Available at: **http://www.globallometree.org/**

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# Support countries in developing their RL/RELs

- **FAO provides support to countries in understanding and developing RL/RELs**
  - Training on RL basics organized in several UN-REDD countries
  - Support to Vietnam in developing RLs for 6 provinces
  - Recently undertook gap analysis and decision-making activity in Tanzania to assess:
    - Scope/scale considerations
    - Forest definition
    - National circumstances
    - Approaches
- **FAO recently launched work to develop country-tailored software solutions to take into account national circumstances in RL/REL modeling**
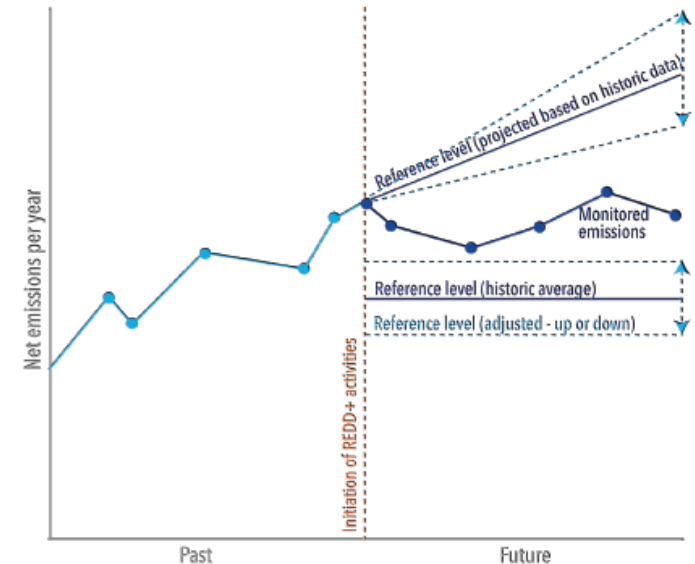
Source: Climate Focus 2013

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Training on GHG inventory for the LULUC/AFOLU sector and data management & analysis
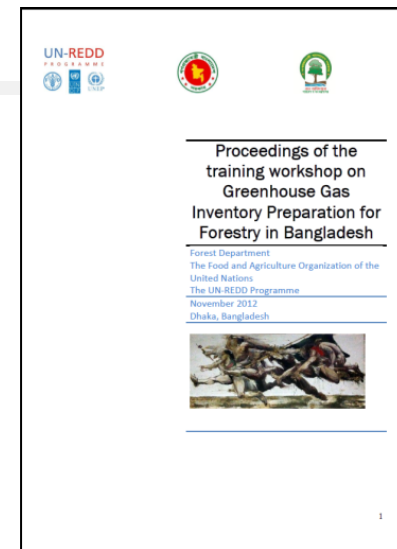
- **Tailored training on GHG inventories based on country-needs**

  - In-house trainings organized by FAO (e.g Bangladesh)

  - Partnership with CD-REDD to develop preliminary GHGI using ALU software (e.g. Zambia, DRC, etc)

  - Joint support with other partners such as MAGHG, UNDP/UNEP and UNFCCC (E.g. Ecuador)

- **FAO supports collection/analysis of data for assessing emission factors**

  - E.g.: Past forest inventories (data collection and availability), standing volume of timber, inventory of forest plantations, volume and biomass equations used in forest plantation inventories, etc

- **FAO has most comprehensive agricultural statistics database for agriculture related emissions (FAO Stats)**

  http://faostat.fao.org/

Proceedings of the training workshop on Greenhouse Gas Inventory Preparation for Forestry in Bangladesh
Forest Department
The Food and Agriculture Organization of the United Nations
The UN-REDD Programme
November 2012
Dhaka, Bangladesh

Initial Area	Forest Land	Grassland	Cropland	Wetland	Settlement	Otherland	Initial Area
Forest Land	10	2	3				15
Grassland		9	1		3		13
Cropland		1	8		1		10
Wetland				14	1		15
Settlement					17		17
Otherland						8	8
Final Area	10	12	12	14	22	8	78
Net Change	5	1	-2	1	-5	0	0