Some African experiences in GHG inventory preparation

Todd Ngara@UNEP RISOE

- UNEP - thru GEF funding - assists 22
   African countries in the preparation of the
   2nd National Communications

- A Senior Task Manager from UNEP Nairobi
   advises on the quality of the NATCOMS.

- Needless to say, this includes GHG's.
   UNEP facilitates consultants to conduct
   in-country training sessions on GHG
   inventory preparation

Experiences from West Africa

I should emphasize that these experiences have been gathered thru both UNEP and UNDP as well as other regional and international organisations in Africa.

14 participating Countries

- **Benin**
- **Burkina Faso**
- **Burundi**
- **Côte d'Ivoire**
- **Gabon**
- **Gambia**
- **Ghana**
- **Guinée**
- **Mali**
- **Niger**
- **Nigeria**
- **Sénégal**
- **Tchad**
- **Togo**

LULUCF relevance in the region

- On average in the region, 55% of GHG emissions are from the LULUCF sector

- LULUCF and Agriculture input data have the highest uncertainty

- LULUCF is specially cited for challenges regarding representative and historical activity data collection, and need for additional training on IPCC methods and software

Priorities identified under the regional inventory project

Need to improve emission factors for the following:

- Forest and Grassland Conversion (LULUCF)

- Enteric Fermentation in Domestic Livestock (Agriculture)

Expected regional project results

- Quality of inventories improved

- Strengthening of ghg inventory institutional framework

- Long-term comprehensive strategy for inventory preparation

- Improvement of data collection and management

- Improvement and dissemination of accurate emission factors in the region

- Establishment of a regional network/exchange of information

Expected regional project results(cont'd)

- Increased the number of trained experts

- Increased stakeholder awareness of climate change

- Establishment of technical peer review system in the region

How do we get to the desired results above?

Thru: Capacity building in regional and national theme-specific workshops as follows:

1. GPG (Accra)
2. Inventory Process (Niamey)
3. EF (Bamako)
4. QC/QA (Libreville)
5. ALU Software (Banjul)
6. Peer Review (Abidjan)

Networking among GHG inventory experts
for information sharing

General problems identified by countries

- Most values used in INC are default values from IPCC
- Predominance of informal sector in the sectors e.g. energy and industry
- Most data are estimated from old surveys
- Inconsistencies and lack of coherence in data provided by different sources
- Data gaps for time series thru various techniques in the IPCC GIs
- Limited national coverage in some data items
- Lack of forest survey

Specific problems identified in agriculture and LULUCF sectors

- Data format, data are not directly usable for GHG e.g. crop residues
- Seasonal migration of animals
- Accurate biomass estimates
- Fraction of total savanna area burnt annually
- Combustion ratio
- Height and diameter measurements

Addressing some of the key problems:

- Institutional arrangement at national level for data collection

- Capacity building at different levels

- Harmonization of data collection

- Involvement of technical departments at country level

Addressing some of the key problems

- Use of satellite images, where feasible to improve data gathering in the LULUCF sector

- Development of country-specific EF's

- EF improvement through funding of regional research projects (i.e. burnt areas, methane from rice cultivation, quantity of nitrogen lost by denitrification)

The following slides dwell on notable pecularities from the region i.e.

- LULUCF
- Agriculture
- Regional collaboration
- Seasonal fires and sub-tropical vegetation

Some resources available used:

<u>Site of number of fires per months or year + biomass</u>
<u>World Fire Atlas</u>

http://wfaa-dat.esrin.esa.int/wfa.php
http://wfaa-dat.esrin.esa.int/wfa_user_guide.php

User Guide

A user via a web browser can extract ATSR World Fire Atlas fire detection classified data in the following formats:

Fires detected overlayed on a map

The number of fires detected on a monthly basis

The number of fires detected on a yearly basis

Improvements needed:

- Conversion Coefficients
  - Carbon content of plants
  - C/N Ratio of plants
  - Aboveground biomass and belowground biomass
  - Annual growth rate of forests and savannas
  - Biomass Fraction burnt
  - Biomass Fraction oxidized

Inventory management

- Information system in many countries
- Information technology widely spread (archiving & storage)
- Use of UNFCCC software –need for hands-on training

QA/QC

- There is need to institute QA/QC practices in a systematic fashion

Long term strategy to improve GHGI

- Institutional measures are identified
- Difficulties related to expertise mobility

Peer review system

- Implemented through regional workshop
- More realistic to have it on cross country basis (Not enough of expertise)

Nitrogen content of cattle manure from different locations in the Sudan Savanna Zone of Ghana

Source: Soil Research Institute – CSIR (1999)

Location	Nitrogen Content (%)
Baku - East	1.45
Baku - West	1.12
Bolgatanga	1.30
Bongo	1.53
Kasena-Nankana	1.32
Builsa	1.33
Mean	**1.34**
CV (%)	**28**

Carbon content of woody species can be obtained by multiplying woody carbon by 0.5 in the Sudanian sub zone and by 0.8 in the Sahalian sub zone.

(Breman, H., Kessler, J.J.,1995. Le rôle des ligneux dans les agro-écosystèmes des régions semi-arides)
(Caims et al., 1997. Root biomass allocation in the world's uplands forest, Oecologia 111, 1-11)

ESA

What have learnt from the West African Project?

- *Need for emission factors that reflect better the national circumstances than the IPCC EFDB*
- *Methodological and AD esp. in the LULUCF – need further refinement esp. link to 1996 IPCC GIs*
- *Regional projects – useful in assisting countries to develop National Inventory Systems*
- *There ought to be increased usage of available tech guidance from the UNFCCC and CGE, NGGIP-IPCC and UNDP-GEF & some Annex I countries i.e. UNFCCC software, satellite imagery for LULUCF, EFDB etc*
- *Hands-on training on methods for uncertainty management in GHG inventories e.g. sensitivity analysis*