



Food and Agriculture Organization
of the United Nations

EX-Ante Carbon-balance Tool Targeting Climate Change Mitigation in Agriculture - Take away notes



Food and Agriculture Organization
of the United Nations

Definition of some concepts

Carbon-balance

- It is the balance between GHG emissions and sinks
 - Emissions have a positive sign
 - Sinks have a negative sign
 - The sum of emissions and sinks makes the carbon balance
 - A positive carbon balance means more emissions
 - A negative carbon balance means emissions reductions and increased carbon sinks
 - The carbon sinks are within the above ground & below ground biomass, deadwood pool, litter and soil
- The carbon balance is expressed in tonne of CO₂ equivalent (tCO₂-e)
 - Since we have 3 main GHGs in the AFOLU sector, i.e. CO₂, CH₄ and N₂O, we need to convert them into a unique currency, which is the CO₂ equivalent (CO₂-e)
 - How do we do: we multiply CH₄ and N₂O by their respective Global Warming Potential (GWP)
 - GWP CO₂ = 1
 - GWP CH₄ = 25
 - GWP N₂O = 298
 - GWP means that 1 tonne of CH₄ equals 25 tonnes of CO₂, and one of N₂O equals 298 CO₂. **Therefore the most potent GHG is N₂O!**

Let's link it with EX-ACT...

Component of the project	Gross fluxes	Gross fluxes
	Without tCO ₂ eq	With tCO ₂ eq
Land Use Changes		
Deforestation	70,000	25,000
Afforestation	-10,000	-20,000
Other	0	0
Agriculture		
Annual	10,000	-5,000
Perennial	-10,000	-15,000
Rice	0	0
Grassland & Livestocks		
Grassland	0	0
Livestock	15,000	5,000
Degradation	5,000	-10,000
Inputs & Investments	0	0
Total	80,000	-20,000

This is the carbon balance of the without project scenario (or the baseline scenario)

This is the carbon balance of the with project scenario

Let's link it with EX-ACT...

Component of the project	Gross fluxes			Balance
	Without tCO ₂ eq	With tCO ₂ eq		
Land Use Changes				
Deforestation	70,000	25,000		-45,000
Afforestation	-10,000	-20,000		-10,000
Other	0	0		0
Agriculture				
Annual	10,000	-5,000	=	-15,000
Perennial	-10,000	-15,000	=	-5,000
Rice	0	0		0
Grassland & Livestocks				
Grassland	0	0		0
Livestock	15,000	5,000		-10,000
Degradation	5,000	-10,000		-15,000
Inputs & Investments	0	0		0
Total	80,000	-20,000		-100,000

- In EX-ACT the carbon balance is the difference of the carbon balance between the WITH PROJECT scenario and the one of the WITHOUT PROJECT scenario.
- We can also say that the carbon balance of EX-ACT (Blue rectangle) is **the potential of mitigation of your project.**

The EX-ACT matrice of changes

- Remember how to read it?

From right to left and from up to down

Mineral soils (ha)		FINAL							Total Initial
		Forest/Plantation	Agriculture			Grassland	Other lands		
INITIAL	Forest/Plantation	152000	0	0	0	0	38000	0	190000
	Agriculture	0	0	0	0	0	0	0	0
	Annual	0	0	0	0	0	0	0	0
	Perennial	0	0	0	0	0	0	0	0
	Rice	0	0	0	0	0	0	0	0
	Grassland	0	0	0	0	0	0	0	0
	Other lands	0	0	0	0	0	0	0	0
Degraded	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	30000	30000	
Total Final		152000	0	0	0	0	38000	30000	220000

Tier 1 versus tier 2

- Please revised the ad-hoc ppt
- Remember it is more suitable to shift to tier 2 (local data on carbon stocks and/or emissions factors) when possible
- Always justify the choice of you Tier 2 data and its reference

Social cost of carbon

- The social cost of carbon attempts to capture the marginal (global) damage cost of an additional unit of emitted carbon. This approach derives the social value of carbon emissions as the present value of expected future damages caused by an additional tonne of CO₂-equivalent emitted to the atmosphere in different years (US\$ 30 as World Bank recommendation in 2015)

The EX-ACT file

- Save the last version on your desktop or in a folder of your choice. The name should include the version of the tool: EX-ACT-V7.2
- While analyzing open the blank version and rename it with your project name when doing the analysis
 - EX-ACT-V7.2_my project name
- If you are not doing this you might yourself with some data (i.e. Tier 2) from a previous analysis, which will affect your carbon-balance results
- The EX-ACT version is updated once a year more or less