

SM.2: SUPPORTING MATERIAL ON MANAGEMENT OPERATIONS AND OTHER DIRECT HUMAN INFLUENCES THAT LEAD TO DEGRADATION AND DEVEGETATION.

This Annex is here as an aide memoire – hopefully more detailed textual information on the operations/influences will be made available in the IPCC report on the issue of degradation and devegetation (Task 2).

Category	Activity	Above ground biomass C stocks	Below ground biomass C stocks	Litter C stocks	Dead wood stocks	Soil C stocks	CH ₄ flux (wet soil)	N ₂ O flux	Reference
a. Pre harvesting	Climber cutting & underbrush clearance	Slightly decrease	No change	Increase	No change	No change	Little effect (Little effect)	Little effect	
a. Pre harvesting	Non-commercial tree-devitalisation ¹	Decrease	Decrease	Slightly increase	Modest increase	May slightly increase	Little effect (Little effect)	Little effect	
a. Pre harvesting	Surface scarifying	Increase	Increase	Mixed with soil to decrease	No change	Decrease	Reduce uptake (Increase in emission)	Increase in emission	
b. Harvesting	Felling (chainsaw complete)	Large decrease	Large decrease	Large increase	Large increase	Large decrease	Decrease in uptake (Increase in emission)	Increase in emission	
b. Harvesting	Felling (chainsaw selective)	Decrease	Decrease	Increase	Increase	Little effect	Little effect (Little effect)	Little effect	
b. Harvesting	Felling and processing (harvesters)	Large decrease	Large decrease	Large decrease	Large increase	Large decrease	Decrease uptake (Increase in emission)	Increase in emission	
b. Harvesting	Unmanaged extraction (e.g. skidders)	Decrease	Decrease	Increase	Increase	Large decrease	Decrease in uptake (Increase in emission)	Increase in emission	

¹ Sometimes just ring-barking, or coating painting thin-barked species with diesel fuel, often poisoning with 2,4, -5 t. Sometimes small pioneer trees are poisoned with diesel ---: The item does not relate to the activity

Category	Activity	Above ground biomass C stocks	Below ground biomass C stocks	Litter C stocks	Dead wood stocks	Soil C stocks	CH4 flux (wet soil)	N2O flux	Reference
b. Harvesting	Careful extraction (e.g. forwarder)	Decrease	Decrease	Increase	Increase	Slight decrease	Little effect (Little effect)	Little effect	
b. Harvesting	Stump & Root extraction	Large decrease	Large decrease	Decrease	Large decrease	Large decrease	Decrease in uptake (Increase in emission)	Large increase in emission	
b. Harvesting	Whole tree harvesting	Large decrease	Large decrease	Large decrease	No change	Large decrease	Decrease in uptake (Increase in emission)	Increase in emission	
b. Harvesting	Residue comminution	---	---	Increase	Increase	Increase	Decrease in uptake (Little effect)	Increase in emission	
b. Harvesting	Residue combustion	---	---	Largely decrease	Largely decrease	Decrease but charcoal may be added	Large emission (Large emission)	Large emission	
b. Harvesting	Onsite portable milling/ chainsaw planking	Largely decrease	Largely decrease	Increase	Increase	Decrease	Decrease in uptake (Decrease in emission)	Increase in emission	
b. Harvesting	Road construction	Decrease	Decrease	Decrease	Decrease	Decrease	Decrease in uptake (Increase in emission)	Increase in emission	
b. Harvesting	Storage of logs in forest	---	---	---	Slightly decrease by decay	---	---	---	
b. Harvesting	Final removal of logs/planks.	---	---	---	Decrease	---	---	---	
c. Regeneration	Deep ploughing/ draining/ ripping	Increase	Increase	Decrease	Decrease	Decrease	Decrease in uptake (Increase in emission)	Increase in emission	

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c. Regeneration	Careful site preparation – e.g. mounding	Increase	Increase	Slight decrease	Little effect	Slight decrease	Slight decrease in uptake (Slight reduction in emission)	Slight increase in emission	
c. Regeneration	Direct seeding	Increase	Increase	Decrease	No effect	Decrease	Decrease in uptake (Increase in emission)	Increase in emission	
c. Regeneration	Fertilisation	Increase	Increase	Decrease	Decrease	Decrease	Decrease in uptake (Increase in emission)	Large increase in emission	
c. Regeneration	Planting (inc replanting)	Increase	Increase	Increase	---	---	---	---	
c. Regeneration	Weeding	Slightly decrease	No effect	increase	No effect	No effect	Slightly decrease in uptake (Little effect)	Slightly increase in emission	
c. Regeneration	Animal protection (guards/fencing)	Increase	Increase	---	---	---	---	---	
d. Stand Management	Clearance for commercial crops (e.g. coffee, oil palm)	Decrease	Decrease	Decrease	Decrease	Decrease	Decrease in uptake (Increase in emission)	Increase in emission through fertilisatin	
d. Stand management	Thinning (pre commercial)	Decrease	Decrease	Increase	Large increase	Slight increase	Little effect (Little effect)	Little effect	
d. Stand management	Thinning (commercial)	Decrease	Decrease	Increase	Increase	Slight increase	Little effect (Little effect)	Little effect	
d. Stand management	Fuelwood removal	---	---	Little effect	Decrease	Little effect	No effect (Little effect)	No effect	
d. Stand management	Pest control	Increase	Increase	Little effect	Decrease	No effect	No effect (Little effect)	No effect	

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d. Stand management	Fertilisation	Increase	Increase	Increase by increasing production, or decrease by increase in decomposition	Increase by increasing production, or decrease by increase in decomposition	Increase	Decrease in uptake (Increase in emission)	Large emission	
d. Stand management	pruning (selective)	Slight decrease	No effect	Increase	Increase	Little effect	No effect (Little effect)	No effect	
d. Stand management	sanitary fellings	Decrease	Decrease	Increase	Increase	Little effect	Little effect (Little effect)	Little effect	
d. Stand management	raking litter	Little effect	Little effect	Decrease	Decrease	Slight decrease	Little effect	Decrease emission	
d. Stand management	fire breaks + pre-burns	Decrease	Decrease	Decrease	Decrease	Decrease	Large emission (Large emission)	Large emission	
d. Stand management	Establishing Protected Areas	Increase	Increase	Increase	Increase	Increase	Increase in uptake (Increase in emission)	Reduce emission	
e. Neighbouring Effects	Spraying, drainage & other management on adjacent lands.	Decrease or increase	Decrease or increase	Decrease	Decrease	Decrease	(Decrease in emission)	Increase in emission	
e. Neighbouring Effects	Pressure for cropping & grazing.	Decrease	Decrease	Decrease	Increase	Decrease	Decrease in uptake by soil compaction or by contamination of fertiliser	Increase in emission	
e. Neighbouring Effects	Recreation	Decrease	Decrease	Decrease	Decrease	Decrease	Decrease in uptake (Increase in emission)	Increase in emission	
e. Neighbouring Effects	Rural Land Abandonment	Increase	Increase	Increase	Increase	Increase	Increase in uptake (Increase in emission)	Decrease in emission	

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e. Neighbouring Effects	Water-table lowering by neighbouring agriculture & urban uses	Decrease	Decrease	Litter effect	Little effect	Little effect	Little effect (Decrease in emission)	Little effect	
e. Neighbouring Effects	Canalisation and alteration of watercourses	Tree death	Tree death	Increase	Increase	Increase	Emission occur (Increase in emission)	Increase in emission	
e. Neighbouring Effects	Introduction exotic flora and fauna.	Decrease	Decrease	Increase	Increase	Slight increase	Little effect (Little effect)	Little effect	
e. Neighbouring Effects	Conflict, war & transmigration resulting in periodic high pressure on forest resources & use of war-linked herbicides.	Decrease	Decrease	Decrease	Decrease	Decrease	Decrease in uptake (Increase in emission)	Increase in emission	
f. Global Effect	Breeding and tree improvement	Increase	Increase	Increase	Increase	Increase	---	---	
f. Global Effects	CO2 fertilisation	Increase	Increase	Increase	Increase	Little effect	Little effect (Little effect)	Little effect	
f. Global Effects	Atmospheric fertilisation (mainly N)	Increase	Increase	Increase by high production or decrease by mineralisation	Increase	Increase	Reduce uptake (Increase emission)	Increase emission	
f. Global Effects	Temperature increase	Increase or decrease	Increase or decrease	Decrease	Decrease	Decrease	Increase in uptake (Increase in emission)	Increase in emission	
f. Global Effects	Rainfall decrease	Increase or decrease	Increase or decrease	Increase	Increase	Decrease	Decrease in uptake (Decrease in emission)	Decrease in emission	

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f. Global Effects	Deeper cyclonic systems	Decrease	Decrease	Increase	Increase	Little effect	Decrease in uptake (Increase in emission)	Increase in emission	
f. Global Effects	Atmospheric pollution (e.g. sulphur and ozone)	Decrease	Decrease	Increase	Increase	Little effect	Decrease in uptake (Increase in emission)	Increase in emission	