JRC analysis: methods used by EU MS for estimating and reporting emissions from SOM and DOM pools in FL converted to SL

Conversion from Forest land to Settlements is an important component of the total deforestation, being some 30 % of total area reported as deforested and some 15 % of total area reported under conversion's categories. While conversion to WL and OL may be caused by natural effects, direct human induced action is indisputable for conversion to SL, thus all GHG emissions are anthropogenic. Generally, the C pools are not uniformly disturbed over the whole area converted (i.e. usually only part of converted area is sealed, trees or upper soils layer is removed) and carbon transfer to DW, LT and SOM pools diminish significantly.

Although decision 16/CMP.1 requires that all five carbon pools need be reported for KP accounting purpose, and despite the presence of CO2 emissions from all C pools in FL converted to SL seems extremely likely, *IPCC 2033 GPG* does not to provide methods to estimate changes in all pools in conversions to SL (Table 1).

Table 1. GPG LULUCF 2003 methodologies for FL converted to SL

TIER 1		SL	
		SLrSL	LcSL
Living Biomass	AGB		Y [2]
	BGB	-	Y [2]
Dead Organic Matter	DW		0
	L	-	0
SOM	Mineral		0
	Organic	-	0
Y	To be mandatorily reported		
0	Failure in making mandatory the reporting of stock losses in case of conversion (from forest)		
-	Non mandatory		
2	To be reported as instantaneously oxidized in conversion.		

Using the argument of lack of methods under IPCC GPG 2003, some MS do not report emissions from dead wood, litter and/or mineral soil from FL converted to SL. For the MS reporting emissions from these pools in FL converted to SL (14 MS out of 25), the following methods are applied.

DOM (DW, LT). It is assumed that entire C stock in DOM pools is instantaneously oxidized in the initial moment of conversion from FL to SL. It is also assumed that there is no dead wood and litter on settlements lands. Emissions are estimated based on per area average C stock of DW and LT determined either at national or regional scale or specific to each deforestation site.

SOM. Several assumptions are involved based on expert judgment or, occasionally, from some scientific studies. For instance, in Sweden C stock in SL is estimated as the weighted average of C stocks under two strata: unsealed and sealed. Unsealed area is considered to cover 40-66% of national SL or conversion to SL area (i.e. AT, LU), going down to 2-3% in cities (i.e. BG). Associated C stock is derived from (depending on MS):

- data from measurements in green area of the city (from scientific studies);
- same C stock as under 'GL remaining GL' (assuming that under national circumstances GL is the source of land for settlement's expansion);
- lowest C stock value among the major land categories FL, CL and GL (assuming limited change of C stock in the soil under construction);
- applying a factor against C stock in previous land use (i.e. constant loss of 50 % by FR).

For sealed areas C stock is conservatively set to zero (assuming all C was emitted/removed) or very low values (1.8tC/ha by BG).

Further issues to be considered in estimation and reporting:

- For dead wood and litter pools, IPCC Guidelines 2006 provides in Ch.8 a Tier 1 default which assumes all carbon is lost during conversion and it does not take into account any subsequent accumulation in these pools under SL.
- For soil organic matter, IPCC Guidelines 2006 provides in Ch.8 a Tier 1 default which assumes a linear change in the C stocks between final and initial land use. Settlement's C stock is estimated according to reference C stock (SOC_{REF}) and default stock change factors (F_{LU}, F_{MG}, F_I) according to the 'sealing' status (i.e. paved, grass or tree covered, gardens associated with closest land use category).
- Share of sealed/unsealed differs in urban and rural;

In conclusion, given the need to account for all C pools under KP reporting, unless evidence is provided that the pool is not a source, the lack of method in IPCC 2003 GPG cannot be used as argument for not accounting a C pool. For estimating changes in DOM and SOM in FL converted to SL in the absence of country-specific methods, it could be considered that methods do exist in the IPCC 2006 GL.