

## APPENDIX 6 – Brazil

**Table A6.1.** Carbon debt calculation of Sorriso, Brazil case

**Carbon debt due to conversion Cerrado forest**

			estimates								references
Aboveground carbon stock loss	14.9	Mg C ha <sup>-1</sup>	9.65	9.85	15.9	14.5	6.45	11.55	45.85	5.2	(Barbosa and Fearnside 2005, Fargione et al. 2008)
-9% forest products	2.8	Mg C ha <sup>-1</sup>									(Fargione et al. 2008)
<b>subtotal</b>	<b>12.0</b>	<b>Mg C ha<sup>-1</sup></b>									
Belowground carbon stock loss biomass	3.5	Mg C ha <sup>-1</sup>	23.3%	26.5%	20.6%	30.9%	13.8%	24.6%	22.9%		(Fargione et al. 2008)
soil		Mg C ha <sup>-1</sup>	74.1	56.8	50.4	32.8	68.0				(Zinn et al. 2002, Corbeels et al. 2006, Maquere et al. 2008)
<u>soil C loss</u>			42%	loss							(IPCC 2006)
<u>soil C loss rate (Cerrado-Agriculture)</u>		Mg C ha <sup>-1</sup> yr <sup>-1</sup>	<u>31.1</u>	<u>23.9</u>	<u>21.2</u>	<u>13.8</u>	<u>28.6</u>				(Carvalho et al. 2010)
<u>soil C loss (20 years)</u>			<u>28.8</u>								(IPCC 2006)
<b>subtotal</b>	<b>24.5</b>	<b>Mg C ha<sup>-1</sup></b>									
<b>Total carbon debt</b>	<b>36.6</b>	<b>Mg C ha<sup>-1</sup></b>									
	<b>134.5</b>	<b>Mg CO<sub>2</sub> ha<sup>-1</sup></b>									

**Table A6.2.** Carbon debt calculation of Guarantã do Norte & Alta Floresta, Brazil case

**Carbon debt due to conversion of pasture**

			estimates										references
Aboveground carbon stock loss	1.1	Mg C ha <sup>-1</sup>	1.94	1.89	1.76	0.68	0.63	0.45	0.41				(da Silva et al. 2004)
Belowground carbon stock loss biomass	4.1	Mg C ha <sup>-1</sup>	3.3	4.1	(root:shoot)								(Fargione et al. 2008)
soil stock		Mg C ha <sup>-1</sup>	37.46	54.3									(Maia et al. 2009, Carvalho et al. 2010)
soil C loss	1.2		-7.8%	0.2%	9.3%	6.0%	8.4%	5.1%	15.0%	-0.7%	-9.0%	-0.6%	(Fargione et al. 2008)
	5.3	Mg C ha <sup>-1</sup>											
<b>Total carbon debt</b>	<b>6.4</b>	<b>Mg C ha<sup>-1</sup></b>											
	<b>23.5</b>	<b>Mg CO<sub>2</sub> ha<sup>-1</sup></b>											

**Table A6.3.** Carbon debt calculation of Santarem, Brazil case

**Carbon debt due to conversion of Amazonian rainforest**

			estimates			references
Aboveground carbon stock loss	129.1	Mg C ha <sup>-1</sup>	131.5	141	114.8	(Fearnside et al. 1999, Johnson et al. 2001, Keller et al. 2001)
+dead biomass	13.5	Mg C ha <sup>-1</sup>				(Keller et al. 2001)
-14% forest products	18.1	Mg C ha <sup>-1</sup>				(Fargione et al. 2008)
<b>subtotal</b>	<b>124.5</b>	<b>Mg C ha<sup>-1</sup></b>				
Belowground carbon stock loss biomass	30.5	Mg C ha <sup>-1</sup>	29.5	31.5		(Fearnside et al. 1999, Keller et al. 2001)
soil carbon stock	53.5	Mg C ha <sup>-1</sup>	27.85	96	41.85	
soil carbon loss	33.2	Mg C ha <sup>-1</sup>	62.0%			(IPCC 2006)
<b>subtotal</b>	<b>63.7</b>	<b>Mg C ha<sup>-1</sup></b>				
<b>Total carbon debt</b>	<b>188.2</b>	<b>Mg C ha<sup>-1</sup></b>				
	<b>691.7</b>	<b>Mg CO<sub>2</sub> ha<sup>-1</sup></b>				
<b>Carbon debt due to conversion of agricultural land</b>						
<b>Total carbon debt</b>	<b>0.0</b>	<b>Mg C ha<sup>-1</sup></b>				
	<b>0.0</b>	<b>Mg CO<sub>2</sub> ha<sup>-1</sup></b>				

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