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Overview of used values sorted by biome

This Appendix gives an overview of the details of all 665 data points used, and their sources. For each value estimate the ecosystem service, the monetary value (in Int$/ha/year, standardized for 2007, the country/region, the valuation method and original reference are given. All full references are listed at the end of this appendix.
In addition, we provide an overview of the monetary values of ecosystem services per biome. These overviews provide the number of used values, the mean, the median, the standard deviation of the mean, the minimum and the maximum value.

In the tables with the used values the following variables are shown:
(1) – Ecosysten service – The TEEB classification of ecosystem services has been used (De Groot (2010a)). In addition, each value is linked to a specific SubService (for a complete list of SubServices see Van der Ploeg et al (2010)). These are not shown in this table, but are provided in the original database.
(2) – Value – The monetary values are shown in the standardized unit which was used for calculations (Int$/ha/yr (2007-value).
(3) – Valuation Method - The acronyms for the valuation methods are: AC - Avoided Cost; BT - Benefit transfer; CV / GV - Contingent Valuation and Group Valuation ; DMP - Direct market pricing; HP - Hedonic Pricing; FI /PF - Factor Income / Production Function; MC / RC - Mitigation and Restoration Cost; PES – Payment for Ecosystem services (not a valuation method per se but seen as an expressed WTP for a given service); RC - Replacement cost; TC - Travel Cost and TEV – Total Economic Value (shown only to include all values)
(4) - Country / Region. We used the UN classification of countries and overseas territories.
(5) – Reference - The full references of the publications are provided in the reference list at the end of this appendix.

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1. Open Oceans

The open ocean is the largest area of the marine ecosystem, including deep sea (water and sea floor below 200 m). Excluded from this biome-section are shelf sea, coral reefs, ocean islands and atolls which are included in other Biomes.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 1.1 Monetary value of services provided by Open Oceans
(in Int. $/ha/year-2007 values)

Open oceans	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**14**	**491**	**135**	**762**	**85**	**1.664**
PROVISIONING SERVICES	**7**	**102**	**61**	**125**	**18**	**323**
1 Food	5	93	52	125	9	315
2 (Fresh) water supply						
3 Raw materials	2	8	8	0	8	8
4 Genetic resources						
5 Medicinal resources						
6 Ornamental resources						
REGULATING SERVICES	**1**	**65**	**65**	**0**	**65**	**65**
7 Influence on air quality						
8 Climate regulation	*1*	*65*	*65*		*65*	*65*
9 Moderation of extreme events						
10 Regulation of water flows						
11 Waste treatment / water purification						
12 Erosion prevention						
13 Nutrient cycling / maintenance of soil fertility						
14 Pollination						
15 Biological control						
HABITAT SERVICES	**2**	**5**	**5**	**4**	**2**	**8**
16 Lifecycle maintenance (esp. nursery service)						
17 Gene pool protection (conservation)	2	5	5	4	2	8
CULTURAL SERVICES	**4**	**319**	**4**	**632**	**1**	**1.268**
18 Aesthetic information						
19 Opportunities for recreation and tourism	4	319	4	632	1	1.268
20 Inspiration for culture, art and design						
21 Spiritual experience						
22 cognitive information (education and science)						

Table 1.2 List of used monetary values per service for Open Oceans

ESService		Value	Valuation Method	Country	Reference
1	Food	9	DMP	Samoa	Mohd-Shahwahid and McNally (2001)
1	Food	63	DMP	Eritrea	Emerton and Asrat (1998)
1	Food	52	FI / PF	United Kingdom	Beaumont et al. (2008)
1	Food	315	FI / PF	Djibouti	Emerton (1998)
1	Food	27	DMP	United Kingdom	Homarus Ltd. (2007)
3	Raw materials	8	FI / PF	United Kingdom	Beaumont et al. (2008)

3	Raw materials	8	FI / PF	United Kingdom	Beaumont et al. (2008)
8	Climate	65	AC	United Kingdom	Beaumont et al. (2008)
17	Genepool	2	CV	South Africa	Turpie (2003)
17	Genepool	8	CV	United Kingdom	Beaumont et al. (2008)
19	Recreation	1	CV	Samoa	Mohd-Shahwahid and McNally (2001)
19	Recreation	1.268	FI / PF	United Kingdom	Beaumont et al. (2008)
19	Recreation	2	FI / PF	Eritrea	Emerton and Asrat (1998)
19	Recreation	7	DMP	United Kingdom	Homarus Ltd. (2007)

2. Coral reefs

Corals are often included in the "coastal systems-biome" but are dealt with here separately because of their unique and important ecosystem services.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 2.1 Monetary value of services provided by Coral reefs
(in Int. $/ha/year-2007 values)

Coral reefs	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**94**	**352.915**	**197.900**	**668.639**	**36.794**	**2.129.122**
PROVISIONING SERVICES	**30**	**55.724**	**33.740**	**39.144**	**33.073**	**105.106**
1 Food	21	677	155	1.458	0	6.175
2 (Fresh) water supply						
3 Raw materials	3	21.528	245	37.067	9	64.328
4 Genetic resources	*1*	*33.048*	*33.048*		*33.048*	*33.048*
5 Medicinal resources						
6 Ornamental resources	5	472	292	619	16	1.555
REGULATING SERVICES	**16**	**172.144**	**156.770**	**249.001**	**1.505**	**412.838**
7 Influence on air quality						
8 Climate regulation	3	1.188	1.291	1.058	83	2.192
9 Moderation of extreme events	10	16.991	1.514	32.208	4	104.134
10 Regulation of water flows						
11 Waste treatment / water purification	*1*	*85*	*85*		*85*	*85*
12 Erosion prevention	2	153.880	153.880	215.735	1.333	306.427
13 Nutrient cycling / maintenance of soil fertility						
14 Pollination						
15 Biological control						
HABITAT SERVICES	**9**	**16.210**	**1.099**	**32.731**	**7**	**92.401**
16 Lifecycle maintenance (esp. nursery service)	*1*	*0*	*0*		*0*	*0*
17 Gene pool protection (conservation)	8	16.210	1.099	32.731	7	92.401
CULTURAL SERVICES	**39**	**108.837**	**6.291**	**347.763**	**2.208**	**1.518.777**
18 Aesthetic information	3	11.390	4.614	13.875	2.204	27.351
19 Opportunities for recreation and tourism	29	96.302	1.562	331.298	0	1.484.996
20 Inspiration for culture, art and design	*1*	*0*	*0*		*0*	*0*
21 Spiritual experience						
22 cognitive information (education and science)	6	1.145	114	2.590	4	6.429

Table 2.2 List of used monetary values per service for Coral reefs

ESService		Value	Valuation Method	Country	Reference
1	Food	520	DMP	Trinidad and Tobago	Burke et al. (2008)
1	Food	357	DMP	Saint Lucia	Burke et al. (2008)
1	Food	155	DMP	Belize	Cooper et al. (2009)
1	Food	0	GV	India	Walpole et al. (2001)
1	Food	99	DMP	Kenya	Emerton and Tessema (2001)
1	Food	53	DMP	Jamaica	Cesar and Chong (2004)
1	Food	3	DMP	Australia	Access Economics (2008)
1	Food	3.387	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	197	FI / PF	Indonesia	Hargreaves-Allen (2004)
1	Food	77	DMP	Vietnam	Nam and Son (2001)
1	Food	339	DMP	Sri Lanka	Berg et al. (1998)
1	Food	785	DMP	Indonesia	Burke et al. (2002)
1	Food	702	DMP	Philippines	Burke et al. (2002)
1	Food	130	DMP	Caribbean	Burke and Maidens (2004)
1	Food	78	DMP	French Polynesia	Charles (2005)
1	Food	56	DMP	French Polynesia	Charles (2005)
1	Food	6.175	DMP	Jamaica	Ruitenbeek and Cartier (1999)
1	Food	1	DMP	Ecuador	De Groot (1992)
1	Food	884	DMP	Philippines	Montenegro et al. (2005)
1	Food	222	DMP	Philippines	White et al. (2000)
1	Food	1	DMP	Kenya	Emerton and Tessema (2001)
3	Raw materials	245	DMP	French Polynesia	Charles (2005)
3	Raw materials	9	DMP	Ecuador	De Groot (1992)
3	Raw materials	64.328	DMP	Sri Lanka	Berg et al. (1998)
4	Genetic	33.048	DMP	Jamaica	Ruitenbeek and Cartier (1999)
6	Ornamental	292	DMP	USA	Cesar et al. (2002)
6	Ornamental	150	DMP	USA	Cesar et al. (2002)
6	Ornamental	345	DMP	USA	Cesar et al. (2002)
6	Ornamental	16	DMP	Kenya	Emerton and Tessema (2001)
6	Ornamental	1.555	DMP	Ecuador	De Groot (1992)
8	Climate	83	DMP	French Polynesia	Charles (2005)
8	Climate	2.192	AC	Eritrea	Emerton and Asrat (1998)
8	Climate	1.291	DMP	Djibouti	Emerton (1998)
9	Extreme events	12.426	AC	Trinidad and Tobago	Burke et al. (2008)
9	Extreme events	20.066	AC	Saint Lucia	Burke et al. (2008)
9	Extreme events	1.720	AC	Belize	Cooper et al. (2009)
9	Extreme events	4	AC	Jamaica	Cesar and Chong (2004)
9	Extreme events	9	AC	Indonesia	Hargreaves-Allen (2004)
9	Extreme events	104.134	RC	Sri Lanka	Berg et al. (1998)
9	Extreme events	619	DMP	Caribbean	Burke and Maidens (2004)
9	Extreme events	1.052	RC	French Polynesia	Charles (2005)
9	Extreme events	1.309	RC	Philippines	Spurgeon (1992)
9	Extreme events	28.566	FI / PF	Jamaica	Ruitenbeek et al 1999
11	Waste	85	RC	Ecuador	De Groot (1992)
12	Erosion	306.427	DMP	Jamaica	Ruitenbeek and Cartier (1999)
12	Erosion	1.333	DMP	Ecuador	De Groot (1992)
16	Nursery	0	DMP	Ecuador	De Groot (1992)
17	Genepool	29	FI / PF	Kenya	Emerton and Tessema (2001)

17	Genepool	32.439	CV	USA	Cesar et al. (2002)
17	Genepool	2.561	CV	USA	Cesar et al. (2002)
17	Genepool	2.145	CV	USA	Cesar et al. (2002)
17	Genepool	46	CV	French Polynesia	Charles (2005)
17	Genepool	53	CV	Guadeloupe	Raboteur and Rhodes (2006)
17	Genepool	92.401	CV	Jamaica	Ruitenbeek and Cartier (1999)
17	Genepool	7	DMP	Ecuador	De Groot (1992)
18	Aesthetic	27.351	DMP	USA	Cesar et al. (2002)
18	Aesthetic	2.204	DMP	USA	Cesar et al. (2002)
18	Aesthetic	4.614	CV	French Polynesia	Charles (2005)
19	Recreation	79.263	DMP	Trinidad and Tobago	Burke et al. (2008)
19	Recreation	94.240	DMP	Saint Lucia	Burke et al. (2008)
19	Recreation	1.783	DMP	Belize	Cooper et al. (2009)
19	Recreation	6.289	TC	Vietnam	Nam and Son (2001)
19	Recreation	146	CV	Vietnam	Nam and Son (2001)
19	Recreation	1.454	DMP	Kenya	Emerton and Tessema (2001)
19	Recreation	0	DMP	Australia	Access Economics (2008)
19	Recreation	3	DMP	Australia	Access Economics (2008)
19	Recreation	2.428	DMP	Philippines	Samonte-Tan et al. (2007)
19	Recreation	7.576	TC	Netherlands Antilles	Pendleton (1995)
19	Recreation	1	CV	Indonesia	Hargreaves-Allen (2004)
19	Recreation	25	DMP	Indonesia	Hargreaves-Allen (2004)
19	Recreation	43	TC	Australia	Carr and Mendelsohn (2003)
19	Recreation	215	CV	Malaysia	Yeo (2004)
19	Recreation	1.426	TC	Philippines	Ahmed et al. (2007)
19	Recreation	10	CV	Philippines	Ahmed et al. (2007)
19	Recreation	4.081	DMP	Sri Lanka	Berg et al. (1998)
19	Recreation	884	DMP	Caribbean	Burke and Maidens (2004)
19	Recreation	1.058.813	DMP	USA	Cesar et al. (2002)
19	Recreation	12.013	DMP	USA	Cesar et al. (2002)
19	Recreation	3.974	DMP	USA	Cesar et al. (2002)
19	Recreation	9.523	DMP	French Polynesia	Charles (2005)
19	Recreation	1.484.996	DMP	Jamaica	Ruitenbeek and Cartier (1999)
19	Recreation	18.566	CV	Thailand	Seenprachawong (2003)
19	Recreation	66	DMP	Ecuador	De Groot (1992)
19	Recreation	1.562	DMP	Netherlands Antilles	Dixon et al. (1993)
19	Recreation	1.709	DMP	USA	Hoagland et al. (1995)
19	Recreation	711	DMP	Australia	Hoagland et al. (1995)
19	Recreation	963	DMP	Philippines	White et al. (2000)
20	Inspiration	0	DMP	Ecuador	De Groot (1992)
22	Cognitive	154	Other	Philippines	Samonte-Tan et al. (2007)
22	Cognitive	6.429	DMP	USA	Cesar et al. (2002)
22	Cognitive	108	PES	French Polynesia	Charles (2005)
22	Cognitive	4	DMP	Ecuador	De Groot (1992)
22	Cognitive	51	DMP	Australia	Driml (1994)
22	Cognitive	121	DMP	USA	Cesar and Beukering (2004)

3. Coastal systems

The coastal biome includes several distinct ecosystems such as sea-grass fields, shallow seas of continental shelves, rocky shores and beaches, which are found in the terrestrial near-shore as well as the intertidal zones – i.e. until the 200m bathymetric line with open oceans. Usually, coral reefs and coastal wetlands (mangroves and tidal marshes) are also included in the "coastal systems-biome" but are dealt with here separately because of their unique and important ecosystem services.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 3.1 Monetary value of services provided by Coastal systems
(in Int. $/ha/year-2007 values)

Coastal systems	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**28**	**28.917**	**26.760**	**5.045**	**26.167**	**42.063**
PROVISIONING SERVICES	**15**	**2.396**	**409**	**4.624**	**2**	**15.029**
1 Food	12	2.384	408	4.604	1	14.993
2 (Fresh) water supply						
3 Raw materials	3	12	1	20	1	35
4 Genetic resources						
5 Medicinal resources						
6 Ornamental resources						
REGULATING SERVICES	**2**	**25.847**	**25.847**	**0**	**25.847**	**25.847**
7 Influence on air quality						
8 Climate regulation	*1*	*479*	*479*		*479*	*479*
9 Moderation of extreme events						
10 Regulation of water flows						
11 Waste treatment / water purification						
12 Erosion prevention	*1*	*25.368*	*25.368*		*25.368*	*25.368*
13 Nutrient cycling / maintenance of soil fertility						
14 Pollination						
15 Biological control						
HABITAT SERVICES	**4**	**375**	**409**	**89**	**274**	**441**
16 Lifecycle maintenance (esp. nursery service)	3	194	229	89	93	260
17 Gene pool protection (conservation)	*1*	*180*	*180*		*180*	*180*
CULTURAL SERVICES	**7**	**300**	**95**	**332**	**44**	**747**
18 Aesthetic information						
19 Opportunities for recreation and tourism	5	256	52	332	0	703
20 Inspiration for culture, art and design						
21 Spiritual experience	*1*	*21*	*21*		*21*	*21*
22 cognitive information (education and science)	*1*	*22*	*22*		*22*	*22*

Table 3.2 List of used monetary values per service for Coastal systems

ESService		Value	Valuation Method	Country	Reference
1	Food	651	DMP	Tanzania	Turpie (2000)
1	Food	4	DMP	Tanzania	Turpie (2000)
1	Food	8.292	DMP	South Africa	Turpie(2003b)
1	Food	1	DMP	India	Whittingham et al. (ed) (2003)
1	Food	183	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	38	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	59	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	17	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	1.919	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	633	DMP	Netherlands	De Groot (1992)
1	Food	1.815	FI / PF	USA	Hughes (2006)
1	Food	14.993	FI / PF	Philippines	Montenegro et al. (2005)
3	Raw materials	1	DMP	Tanzania	Turpie (2000)
3	Raw materials	1	DMP	Tanzania	Turpie (2000)
3	Raw materials	35	DMP	Netherlands	De Groot (1992)
8	Climate	479	RC	USA	Hughes (2006)
12	Erosion	25.368	MC / RC	Philippines	Montenegro et al. (2005)
16	Nursery	93	FI / PF	Tanzania	Turpie (2000)
16	Nursery	260	DMP	Netherlands	De Groot (1992)
16	Nursery	229	FI / PF	Australia	McArthur and Boland (2006)
17	Genepool	180	CV	South Africa	Turpie(2003b)
19	Recreation	4	DMP	Indonesia	Erdmann et al. (2003)
19	Recreation	522	DMP	Philippines	Samonte-Tan et al. (2007)
19	Recreation	0	DMP	Philippines	Samonte-Tan et al. (2007)
19	Recreation	52	DMP	Seychelles	Mathieu et al. (2003)
19	Recreation	703	DMP	Netherlands	De Groot (1992)
21	Spiritual	21	CV	Netherlands	De Groot (1992)
22	Cognitive	22	DMP	Netherlands	De Groot (1992)

4. Coastal wetlands

The coastal wetlands biome includes two main types of ecosystem, tidal marshes and mangroves (for other coastal systems, see section 3). The coverage of this section is weighted towards mangrove ecosystems although the available valuation literature on tidal marshes is also presented.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 4.1 Monetary value of services provided by Coastal wetlands
(in Int. $/ha/year-2007 values)

Coastal Wetlands	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**139**	**193.845**	**12.163**	**384.192**	**300**	**887.828**
PROVISIONING SERVICES	**59**	**2.998**	**935**	**6.920**	**18**	**27.845**
1 Food	27	1.111	234	3.564	0	18.743
2 (Fresh) water supply	4	1.217	296	2.055	1	4.277
3 Raw materials	25	358	93	884	0	4.218
4 Genetic resources	*1*	*10*	*10*		*10*	*10*
5 Medicinal resources	2	301	301	417	7	596
6 Ornamental resources						
REGULATING SERVICES	**35**	**171.515**	**7.738**	**332.731**	**249**	**685.696**
7 Influence on air quality						
8 Climate regulation	6	65	31	74	7	184
9 Moderation of extreme events	20	5.351	2.238	7.845	2	32.291
10 Regulation of water flows						
11 Waste treatment / water purification	4	162.125	4.197	318.660	6	640.099
12 Erosion prevention	4	3.929	1.226	6.151	188	13.076
13 Nutrient cycling / maintenance of soil fertility	*1*	*45*	*45*		*45*	*45*
14 Pollination						
15 Biological control						
HABITAT SERVICES	**26**	**17.138**	**2.942**	**38.129**	**14**	**145.940**
16 Lifecycle maintenance (esp. nursery service)	20	10.648	1.127	29.020	5	123.886
17 Gene pool protection (conservation)	6	6.490	1.815	9.109	9	22.054
CULTURAL SERVICES	**19**	**2.193**	**549**	**6.413**	**20**	**28.347**
18 Aesthetic information						
19 Opportunities for recreation and tourism	19	2.193	549	6.413	20	28.347
20 Inspiration for culture, art and design						
21 Spiritual experience						
22 cognitive information (education and science)						

Table 4.2 List of used monetary values per service for Coastal wetlands

ESService		Value	Valuation Method	Country	Reference
1	Food	376	DMP	Sri Lanka	Emerton and Kekulandala (2003)
1	Food	40	DMP	Belize	Cooper et al. (2009)
1	Food	1	DMP	Tanzania	Turpie (2000)
1	Food	18.743	DMP	El Salvador	Turner et al. (2003)
1	Food	47	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	96	DMP	Philippines	Samonte-Tan et al. (2007)
1	Food	234	DMP	Cambodia	Bann (1997b)
1	Food	115	DMP	USA	Costanza et al. (1989)
1	Food	953	DMP	Sri Lanka	Gunawardena and Rowan (2005)
1	Food	1.753	DMP	Sri Lanka	Gunawardena and Rowan (2005)
1	Food	137	DMP	Philippines	Janssen and Padilla (1999)
1	Food	1.894	DMP	USA	Bell (1989)
1	Food	189	DMP	USA	Farber and Costanza (1987)
1	Food	269	DMP	USA	Gosselink et al. (1974)
1	Food	516	DMP	USA	Gosselink et al. (1974)
1	Food	806	DMP	USA	Gosselink et al. (1974)
1	Food	954	DMP	Thailand	Hamilton and Snedaker (1984)
1	Food	13	DMP	USA	Hickman (1990)
1	Food	10	DMP	Mozambique	Turpie et al. (1999)
1	Food	0	DMP	Mozambique	Turpie et al. (1999)
1	Food	0	DMP	Mozambique	Turpie et al. (1999)
1	Food	1.425	DMP	Philippines	White et al. (2000)
1	Food	115	DMP	Thailand	Barbier (2007)
1	Food	366	FI / PF	Vietnam	Do and Bennett (2005)
1	Food	11	DMP	Vietnam	Tri (2002)
1	Food	532	DMP	Micronesia	Naylor and Drew (1998)
1	Food	396	DMP	Indonesia	Ruitenbeek (1994)
2	Water	47	AC	Sri Lanka	Emerton and Kekulandala (2003)
2	Water	545	DMP	China	Tong et al. (2007)
2	Water	1	RC	Mozambique	Turpie et al. (1999)
2	Water	4.277	Other	United Kingdom	Everard (2009)
3	Raw materials	99	DMP	Sri Lanka	Emerton and Kekulandala (2003)
3	Raw materials	10	DMP	Tanzania	Turpie (2000)
3	Raw materials	48	DMP	Tanzania	Turpie (2000)
3	Raw materials	586	DMP	El Salvador	Turner et al. (2003)
3	Raw materials	152	DMP	Cambodia	Bann (1997b)
3	Raw materials	55	DMP	USA	Costanza et al. (1989)
3	Raw materials	85	DMP	Sri Lanka	Gunawardena and Rowan (2005)
3	Raw materials	318	DMP	Philippines	Janssen and Padilla (1999)
3	Raw materials	4.218	DMP	Netherlands	De Groot (1992)
3	Raw materials	100	DMP	USA	Hickman (1990)
3	Raw materials	0	DMP	Mozambique	Turpie et al. (1999)
3	Raw materials	2	DMP	Mozambique	Turpie et al. (1999)
3	Raw materials	0	DMP	Mozambique	Turpie et al. (1999)
3	Raw materials	111	DMP	Philippines	White et al. (2000)
3	Raw materials	43	DMP	Malaysia	Bennett and Reynolds (1993)
3	Raw materials	120	Other	United Kingdom	Everard (2009)
3	Raw materials	93	Other	United Kingdom	Everard (2009)

3	Raw materials	21	DMP	Vietnam	Do and Bennett (2005)
3	Raw materials	206	DMP	Vietnam	Tri (2002)
3	Raw materials	1	DMP	Vietnam	Tri (2002)
3	Raw materials	2	FI / PF	Pakistan	Khalil (1999)
3	Raw materials	832	AC	Thailand	Sathiratai (1998)
3	Raw materials	43	DMP	Cambodia	Bann (1997b)
3	Raw materials	101	FI / PF	Bangladesh	Ahmad (1984)
3	Raw materials	1.700	DMP	Philippines	Nickerson (1999)
4	Genetic	10	DMP	United Kingdom	Everard (2009)
5	Medical	7	DMP	Cambodia	Emerton et al (2002)
5	Medical	596	CV	El Salvador	MANR (2002)
8	Climate	10	DMP	Sri Lanka	Emerton and Kekulandala (2003)
8	Climate	7	AC	Cambodia	Emerton (ed) (2005)
8	Climate	127	RC	China	Tong et al. (2007)
8	Climate	11	MC / RC	Mozambique	Turpie et al. (1999)
8	Climate	50	Other	United Kingdom	Everard (2009)
8	Climate	184	RC	Thailand	Sathiratai (1998)
9	Extreme events	32.291	AC	India	Badola and Hussain (2005)
9	Extreme events	117	AC	Cambodia	Emerton (ed) (2005)
9	Extreme events	730	CV	China	Tong et al. (2007)
9	Extreme events	1.593	AC	Belize	Cooper et al. (2009)
9	Extreme events	89	AC	Cambodia	Bann (1997b)
9	Extreme events	2.485	CV	Malaysia	Bann (1999)
9	Extreme events	583	AC	USA	Costanza et al. (1989)
9	Extreme events	1.066	RC	Sri Lanka	Gunawardena and Rowan (2005)
9	Extreme events	6.685	RC	Thailand	Sathiratai (1998)
9	Extreme events	10.125	RC	United Kingdom	Dugan (ed) (1990)
9	Extreme events	2	AC	USA	Farber and Costanza (1987)
9	Extreme events	34	AC	USA	Farber and Costanza (1987)
9	Extreme events	11.672	AC	United Kingdom	Beaumont et al. (2008)
9	Extreme events	2	AC	USA	Farber (1987)
9	Extreme events	16.789	RC	Thailand	Barbier (2007)
9	Extreme events	1.991	Other	United Kingdom	Everard (2009)
9	Extreme events	7.100	RC	Thailand	Barbier et al. (2002)
9	Extreme events	2.668	CV	Micronesia	Naylor and Drew (1998)
9	Extreme events	6.330	RC	United Kingdom	King and Lester (1995)
9	Extreme events	4.663	CV	Korea (Republic of)	Pyo (2001)
11	Waste	2.068	RC	Sri Lanka	Emerton and Kekulandala (2003)
11	Waste	6.327	RC	Netherlands	De Groot (1992)
11	Waste	640.099	RC	USA	Gosselink et al. (1974)
11	Waste	6	RC	Mozambique	Turpie et al. (1999)
12	Erosion	448	AC	Cambodia	Emerton (ed) (2005)
12	Erosion	2.005	RC	Philippines	Samonte-Tan et al. (2007)
12	Erosion	13.076	Other	United Kingdom	Everard (2009)
12	Erosion	188	DMP	Indonesia	Ruitenbeek (1994)
13	Soil fertility	45	AC	Guatemala	Ammour et al. (2000)
16	Nursery	5.585	AC	Mexico	Barbier and Strand (1998)
16	Nursery	139	DMP	Tanzania	Turpie (2000)
16	Nursery	706	FI / PF	Philippines	Samonte-Tan et al. (2007)
16	Nursery	1.547	CV	Malaysia	Bann (1999)
16	Nursery	52.279	DMP	Philippines	Janssen and Padilla (1999)
16	nursery	2.819	Other	USA	Farber and Costanza (1987)

16	Nursery	5	FI / PF	USA	Lynne et al. (1981)
16	Nursery	169	FI / PF	Thailand	Barbier et al. (2002)
16	Nursery	7.280	FI / PF	Malaysia	Bennett and Reynolds (1993)
16	Nursery	226	FI / PF	Thailand	Sathiratai (1998)
16	Nursery	268	DMP	Indonesia	Burbridge and Koesoebiono (1984)
16	Nursery	26	CV	Italy	Nunes et al (2004)
16	Nursery	102	DMP	USA	Coriel (1993)
16	Nursery	424	FI / PF	Caribbean	Dharmaratne and Strand (2002)
16	Nursery	7.374	FI / PF	Vietnam	Do and Bennett (2005)
16	Nursery	2.243	FI / PF	USA	Johnston et al (2002)
16	Nursery	2.936	FI / PF	Vietnam	Levine and Mindedal (1998)
16	Nursery	4.911	DMP	Australia	Morton (1990)
16	Nursery	123.886	DMP	Philippines	Nickerson (1999)
16	Nursery service	43	FI / PF	Trinidad and Tobago	Ramdial (1975)
17	Genepool	9	CV	Sri Lanka	Gunawardena and Rowan (2005)
17	Genepool	71	CV	Malaysia	Bann (1999)
17	Genepool	22.054	CV	Malaysia	Bann (1999)
17	Genepool	2.537	Other	United Kingdom	Everard (2009)
17	Genepool	13.176	MC / RC	Vietnam	Tri (2002)
17	Genepool	1.093	CV	Micronesia	Naylor and Drew (1998)
19	Recreation	66	TC	Sri Lanka	Emerton and Kekulandala (2003)
19	Recreation	791	DMP	Belize	Cooper et al. (2009)
19	Recreation	20	TC	USA	Costanza et al. (1989)
19	Recreation	2.001	DMP	USA	Bell (1989)
19	Recreation	180	CV	USA	Bergstrom et al. (1990)
19	Recreation	26	TC	USA	Farber and Costanza (1987)
19	Recreation	688	CV	USA	Gupta and Foster (1975)
19	Recreation	451	DMP	USA	Hickman (1990)
19	Recreation	1.042	DMP	USA	Hickman (1990)
19	Recreation	406	DMP	Philippines	White et al. (2000)
19	Recreation	28.347	FI / PF	USA	Bell (1997)
19	Recreation	4.297	FI / PF	USA	Bell (1997)
19	Recreation	1.277	FI / PF	Malaysia	Bennett and Reynolds (1993)
19	Recreation	44	CV	Nicaragua	Ammour et al. (2000)
19	Recreation	558	Other	United Kingdom	Everard (2009)
19	Recreation	51	TC	Vietnam	Tri (2002)
19	Recreation	39	CV	USA	Farber (1996)
19	Recreation	549	TC	Trinidad and Tobago	Ramdial (1975)
19	Recreation	833	TC	Trinidad and Tobago	Ramdial (1975)

5. Inland wetlands

This biome-type includes (freshwater) floodplains, swamps/marshes and peat lands. It explicitly does not include coastal wetlands (section 4) and rivers & lakes (section 6).

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 5.1 Monetary value of services provided by Inland wetlands
(in Int. $/ha/year-2007 values)

Inland wetlands	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**168**	**25.682**	**16.534**	**36.585**	**3.018**	**104.924**
PROVISIONING SERVICES	**94**	**1.659**	**368**	**4.194**	**115**	**19.552**
1 Food	39	614	30	1.746	0	9.385
2 (Fresh) water supply	17	408	111	871	0	3.467
3 Raw materials	35	425	14	1.439	0	6.390
4 Genetic resources						
5 Medicinal resources	2	99	99	138	1	196
6 Ornamental resources	*1*	*114*	*114*		*114*	*114*
REGULATING SERVICES	**40**	**17.364**	**13.133**	**19.841**	**2.192**	**46.194**
7 Influence on air quality						
8 Climate regulation	6	488	21	884	4	2.216
9 Moderation of extreme events	11	2.986	629	4.582	0	14.619
10 Regulation of water flows	3	5.606	7.134	3.874	1.201	8.484
11 Waste treatment / water purification	15	3.015	80	4.439	4	11.320
12 Erosion prevention	2	2.607	2.607	3.667	14	5.200
13 Nutrient cycling / maintenance of soil fertility	2	1.713	1.713	2.395	20	3.407
14 Pollination						
15 Biological control	*1*	*948*	*948*		*948*	*948*
HABITAT SERVICES	**17**	**2.455**	**1.337**	**5.432**	**8**	**16.590**
16 Lifecycle maintenance (esp. nursery service)	2	1.287	1.287	1.810	8	2.567
17 Gene pool protection (conservation)	15	1.168	50	3.622	0	14.023
CULTURAL SERVICES	**17**	**4.203**	**1.695**	**7.118**	**703**	**22.588**
18 Aesthetic information	4	1.292	943	1.565	0	3.280
19 Opportunities for recreation and tourism	12	2.211	52	5.554	2	18.608
20 Inspiration for culture, art and design	*1*	*700*	*700*		*700*	*700*
21 Spiritual experience						
22 cognitive information (education and science)						

Table 5.2 List of used monetary values per service for Inland wetlands

ESService		Value	Valuation Method	Country	Reference
1	Food	454	DMP	South Africa	Adekola et al. (2008)
1	Food	3	DMP	South Africa	Adekola et al. (2008)
1	Food	3	DMP	South Africa	Adekola et al. (2008)
1	Food	2.361	DMP	China	Tong et al. (2007)
1	Food	142	Other	Zambia	Seyam et al (2001)

1	Food	381	Other	Zambia	Seyam et al (2001)
1	Food	2.608	DMP	Uganda	Emerton et al. (1998)
1	Food	2.584	DMP	Uganda	Emerton et al. (1998)
1	Food	4.787	DMP	Laos	Gerrard (2004)
1	Food	9.385	DMP	Nigeria	Barbier et al. (1991)
1	Food	105	DMP	Malaysia	Kumari (1996)
1	Food	278	DMP	Cambodia	Chong (2005)
1	Food	56	GV	Cambodia	Chong (2005)
1	Food	46	DMP	Uganda	Karanja et al. (2001)
1	Food	1	DMP	Tanzania	Kasthala et al. (2008)
1	Food	1	DMP	Tanzania	Kasthala et al. (2008)
1	Food	0	DMP	Tanzania	Kasthala et al. (2008)
1	Food	0	DMP	Tanzania	Kasthala et al. (2008)
1	Food	3	DMP	Botswana	Mmopelwa et al. (2009)
1	Food	23	DMP	Uganda	Schuijt (2002)
1	Food	29	DMP	Nigeria	Schuijt (2002)
1	Food	1	DMP	Nigeria	Schuijt (2002)
1	Food	230	DMP	Malawi	Schuijt (2002)
1	Food	8	DMP	Malawi	Schuijt (2002)
1	Food	75	DMP	Mozambique	Schuijt (2002)
1	Food	67	DMP	Mozambique	Schuijt (2002)
1	Food	21	DMP	Zambia	Turpie et al. (1999)
1	Food	30	DMP	Zambia	Turpie et al. (1999)
1	Food	0	DMP	Zambia	Turpie et al. (1999)
1	Food	30	DMP	Zambia	Turpie et al. (1999)
1	Food	16	DMP	Zambia	Turpie et al. (1999)
1	Food	3	DMP	Zambia	Turpie et al. (1999)
1	Food	1	DMP	Zambia	Turpie et al. (1999)
1	Food	73	DMP	Malawi	Turpie et al. (1999)
1	Food	53	DMP	Malawi	Turpie et al. (1999)
1	Food	0	DMP	Malawi	Turpie et al. (1999)
1	Food	12	DMP	Malawi	Turpie et al. (1999)
1	Food	29	DMP	Cameroon	Loth (ed) (2004)
1	Food	52	FI / PF	Cameroon	Loth (ed) (2004)
2	Water	256	Other	Malaysia	Kumari (1996)
2	Water	146	AC	USA	Thibodeau and Ostro (1981)
2	Water	278	GV	Cambodia	Chong (2005)
2	Water	278	GV	Cambodia	Chong (2005)
2	Water	111	GV	Cambodia	Chong (2005)
2	Water	1.499	RC	Uganda	Karanja et al. (2001)
2	Water	96	RC	Uganda	Karanja et al. (2001)
2	Water	5	DMP	Malawi	Schuijt (2002)
2	Water	3	RC	Zambia	Turpie et al. (1999)
2	Water	1	RC	Zambia	Turpie et al. (1999)
2	Water	23	RC	Malawi	Turpie et al. (1999)
2	Water	0	MC / RC	Cameroon	Loth (ed) (2004)
2	Water	223	FI / PF	Mongolia	Emerton et al. (2009)
2	Water	3.467	AC	United Kingdom	Everard and Jevons (2010)
2	Water	652	FI / PF	Uganda	Emerton and Muramira (1999)
2	Water	29	RC	Sweden	Folke (1991)
2	Water	10	FI / PF	Bangladesh	Islam and Braden (2006)
3	Raw materials	112	DMP	South Africa	Adekola et al. (2008)

3	Raw materials	57	DMP	South Africa	Adekola et al. (2008)
3	Raw materials	4	DMP	Tanzania	Turpie (2000)
3	Raw materials	25	Other	Zambia	Seyam et al (2001)
3	Raw materials	32	DMP	Uganda	Emerton and Muramira (1999)
3	Raw materials	6.390	DMP	Uganda	Emerton et al. (1998)
3	Raw materials	5.874	DMP	Uganda	Emerton et al. (1998)
3	Raw materials	1.101	DMP	Nigeria	Barbier et al. (1991)
3	Raw materials	32	DMP	Malaysia	Kumari (1996)
3	Raw materials	167	GV	Cambodia	Chong (2005)
3	Raw materials	167	GV	Cambodia	Chong (2005)
3	Raw materials	192	DMP	Denmark	Dubgaard et al. (2002)
3	Raw materials	209	DMP	Uganda	Karanja et al. (2001)
3	Raw materials	2	DMP	Tanzania	Kasthala et al. (2008)
3	Raw materials	1	DMP	Tanzania	Kasthala et al. (2008)
3	Raw materials	1	DMP	Tanzania	Kasthala et al. (2008)
3	Raw materials	0	DMP	Tanzania	Kasthala et al. (2008)
3	Raw materials	0	DMP	Tanzania	Kasthala et al. (2008)
3	Raw materials	0	DMP	Tanzania	Kasthala et al. (2008)
3	Raw materials	74	DMP	Botswana	Mmopelwa et al. (2009)
3	Raw materials	29	DMP	Botswana	Mmopelwa et al. (2009)
3	Raw materials	1	DMP	Botswana	Mmopelwa et al. (2009)
3	Raw materials	4	DMP	Botswana	Mmopelwa et al. (2009)
3	Raw materials	68	DMP	Uganda	Schuijt (2002)
3	Raw materials	124	DMP	Uganda	Schuijt (2002)
3	Raw materials	14	DMP	Nigeria	Schuijt (2002)
3	Raw materials	0	DMP	Nigeria	Schuijt (2002)
3	Raw materials	0	DMP	Malawi	Schuijt (2002)
3	Raw materials	3	DMP	Zambia	Turpie et al. (1999)
3	Raw materials	0	DMP	Zambia	Turpie et al. (1999)
3	Raw materials	9	DMP	Zambia	Turpie et al. (1999)
3	Raw materials	65	DMP	Malawi	Turpie et al. (1999)
3	Raw materials	4	DMP	Malawi	Turpie et al. (1999)
3	Raw materials	7	DMP	Cameroon	Loth (ed) (2004)
3	Raw materials	14	DMP	Uganda	Emerton and Muramira (1999)
5	Medical	196	Other	Zambia	Seyam et al (2001)
5	Medical	1	DMP	Tanzania	Kasthala et al. (2008)
6	Ornamental	114	DMP	South Africa	Adekola et al. (2008)
8	Climate	4	RC	Canada	Anielski and Wilson (2005)
8	Climate	650	AC	Malaysia	Kumari (1996)
8	Climate	17	MC / RC	Zambia	Turpie et al. (1999)
8	Climate	17	MC / RC	Zambia	Turpie et al. (1999)
8	Climate	24	MC / RC	Malawi	Turpie et al. (1999)
8	Climate	2.216	Other	United Kingdom	Everard and Jevons (2010)
9	Extreme events	891	RC	Canada	Anielski and Wilson (2005)
9	Extreme events	629	AC	New Zealand	Department of Conservation (2007)
9	Extreme events	6.116	MC / RC	Sri Lanka	Emerton and Bos (2004)
9	Extreme events	77	Other	Cameroon	Emerton and Bos (2004)
9	Extreme events	6.002	AC	Laos	Gerrard (2004)
9	Extreme events	14.619	AC	USA	Gupta and Foster (1975)
9	Extreme events	48	AC	USA	Thibodeau and Ostro (1981)
9	Extreme events	4.436	AC	USA	Costanza et al. (1997)
9	Extreme events	15	AC	Denmark	Dubgaard et al. (2002)

9	Extreme events	0	AC	Zambia	Turpie et al. (1999)
9	Extreme events	8	AC	Malawi	Turpie et al. (1999)
10	Water flows	1.201	FI / PF	Nigeria	Acharya and Barbier (2000)
10	Water flows	7.134	AC	United Kingdom	UK Environment Agency (1999)
10	Water flows	8.484	RC	USA	Leschine et al (1997)
11	Waste	6.469	RC	Uganda	Emerton (ed) (2005)
11	Waste	11.320	MC / RC	Uganda	Emerton (ed) (2005)
11	Waste	9.468	RC	Uganda	Emerton et al. (1998)
11	Waste	153	RC	Laos	Gerrard (2004)
11	Waste	10.246	AC	Germany	Meyerhoff and Dehnhardt (2004)
11	Waste	73	FI / PF	Malaysia	Kumari (1996)
11	Waste	430	CV	USA	Lant and Roberts (1990)
11	Waste	25	RC	USA	Thibodeau and Ostro (1981)
11	Waste	24	RC	Denmark	Dubgaard et al. (2002)
11	Waste	27	RC	Uganda	Karanja et al. (2001)
11	Waste	6.879	RC	Uganda	Schuijt (2002)
11	Waste	14	RC	Zambia	Turpie et al. (1999)
11	Waste	11	RC	Zambia	Turpie et al. (1999)
11	Waste	80	RC	Malawi	Turpie et al. (1999)
11	Waste	4	RC	Uganda	Emerton and Muramira (1999)
12	Erosion	14	AC	Zambia	Turpie et al. (1999)
12	Erosion	5.200	Other	United Kingdom	Everard and Jevons (2010)
13	Soil fertility	20	RC	Uganda	Karanja et al. (2001)
13	Soil fertility	3.407	RC	Sweden	Bystrom (2000)
15	BioControl	948	Other	United Kingdom	Everard and Jevons (2010)
16	Nursery	8	RC	Sweden	Folke (1991)
16	Nursery	2.567	DMP	Laos	Gerrard (2004)
17	Genepool	31	CV	Senegal	Ly et al. (2006)
17	Genepool	0	Other	Zambia	Seyam et al (2001)
17	Genepool	0	Other	Zambia	Seyam et al (2001)
17	Genepool	267	Other	New Zealand	Department of Conservation (2007)
17	Genepool	2.710	CV	Australia	Mallawaarachchi et al. (2001)
17	Genepool	50	CV	Malaysia	Kumari (1996)
17	Genepool	111	GV	Cambodia	Chong (2005)
17	Genepool	111	GV	Cambodia	Chong (2005)
17	Genepool	111	GV	Cambodia	Chong (2005)
17	Genepool	56	GV	Cambodia	Chong (2005)
17	Genepool	0	Other	Mozambique	Schuijt (2002)
17	Genepool	2	CV	Mozambique	Turpie et al. (1999)
17	Genepool	3	CV	Zambia	Turpie et al. (1999)
17	Genepool	14.023	MC / RC	United Kingdom	Everard and Jevons (2010)
17	Genepool	41	CV	United Kingdom	Luisetti et al. (2008)
18	Aesthetic	0	HP	USA	Thibodeau and Ostro (1981)
18	Aesthetic	1.803	Other	United Kingdom	Everard and Jevons (2010)
18	Aesthetic	83	HP	USA	Amacher (1989)
18	Aesthetic	3.280	CV	Australia	Gerrans (1994)
19	Recreation	2	Other	Zambia	Seyam et al (2001)
19	Recreation	35	DMP	New Zealand	Department of Conservation (2007)
19	Recreation	14	TC	Malaysia	Kumari (1996)
19	Recreation	430	CV	USA	Lant and Roberts (1990)
19	Recreation	29	DMP	USA	Thibodeau and Ostro (1981)
19	Recreation	56	GV	Cambodia	Chong (2005)

19	Recreation	78	FI / PF	Denmark	Dubgaard et al. (2002)
19	Recreation	52	FI / PF	Denmark	Dubgaard et al. (2002)
19	Recreation	52	FI / PF	Denmark	Dubgaard et al. (2002)
19	Recreation	4	DMP	Zambia	Turpie et al. (1999)
19	Recreation	7.176	DMP	United Kingdom	Everard and Jevons (2010)
19	Recreation	18.608	Other	United Kingdom	Everard and Jevons (2010)
20	Inspiration	700	CV	New Zealand	Kirkland (1988)

6. Fresh water lakes and rivers

This biome-type includes freshwater rivers and lakes. Saline lakes, and wetlands and floodplains are not included in this biome (see coastal and inland wetlands).

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 6.1 Monetary value of services provided by Fresh water lakes and rivers
(in Int. $/ha/year-2007 values)

Rivers and Lakes	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**15**	**4.267**	**3.938**	**2.771**	**1.446**	**7.757**
PROVISIONING SERVICES	**10**	**1.914**	**1.998**	**1.480**	**46**	**4.037**
1 Food	2	106	106	147	2	209
2 (Fresh) water supply	8	1.808	1.892	1.333	44	3.828
3 Raw materials						
4 Genetic resources						
5 Medicinal resources						
6 Ornamental resources						
REGULATING SERVICES	**2**	**187**	**187**	**236**	**20**	**354**
7 Influence on air quality						
8 Climate regulation						
9 Moderation of extreme events						
10 Regulation of water flows						
11 Waste treatment / water purification	2	187	187	236	20	354
12 Erosion prevention						
13 Nutrient cycling / maintenance of soil fertility						
14 Pollination						
15 Biological control						
HABITAT SERVICES	**0**	**0**	**0**	**0**	**0**	**0**
16 Lifecycle maintenance (esp. nursery service)						
17 Gene pool protection (conservation)						
CULTURAL SERVICES	**3**	**2.166**	**1.753**	**1.056**	**1.380**	**3.366**
18 Aesthetic information						
19 Opportunities for recreation and tourism	3	2.166	1.753	1.056	1.380	3.366
20 Inspiration for culture, art and design						
21 Spiritual experience						
22 cognitive information (education and science)						

Table 6.2 List of used monetary values per service for Fresh water lakes and rivers

ESService		Value	Valuation Method	Country	Reference
1	Food	209	DMP	India	Verma (2001)
1	Food	2	FI / PF	Laos	Rosales et al. (2005)
2	Water	2.716	AC	India	Verma (2001)
2	Water	3.828	FI / PF	USA	Gibbons (1986)
2	Water	2.660	FI / PF	USA	Gibbons (1986)
2	Water	2.687	FI / PF	USA	Gibbons (1986)
2	Water	647	FI / PF	USA	Gibbons (1986)
2	Water	757	FI / PF	USA	Gibbons (1986)
2	Water	1.124	FI / PF	USA	Gibbons (1986)
2	Water	44	RC	USA	Gibbons (1986)
11	Waste	354	AC	India	Verma (2001)
11	Waste	20	MC / RC	USA	Gibbons (1986)
19	Recreation	1.380	CV	India	Verma (2001)
19	Recreation	3.366	TC	Kenya	Navrud and Mungatana (1994)
19	Recreation	1.753	CV	Kenya	Navrud and Mungatana (1994)

7. Tropical forests

The Tropical Forests biome includes various types of forests in the tropical and subtropical regions, eg. moist- or rainforests, deciduous/semi-deciduous broadleaf forest and tropical mountain forests.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 7.1 Monetary value of services provided by Tropical forest
(in Int. $/ha/year-2007 values)

Tropical forests	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**96**	**5.264**	**2.355**	**6.526**	**1.581**	**20.851**
PROVISIONING SERVICES	**38**	**1.828**	**1.591**	**586**	**1.525**	**3.646**
1 Food	18	200	15	455	0	1.682
2 (Fresh) water supply	3	27	28	19	8	46
3 Raw materials	15	84	31	112	0	402
4 Genetic resources	*1*	*13*	*13*		*13*	*13*
5 Medicinal resources	*1*	*1.504*	*1.504*		*1.504*	*1.504*
6 Ornamental resources						
REGULATING SERVICES	**31**	**2.529**	**692**	**3.996**	**40**	**9.301**
7 Influence on air quality	*1*	*12*	*12*		*12*	*12*
8 Climate regulation	7	2.044	261	3.319	4	8.104
9 Moderation of extreme events	7	66	14	143	1	390
10 Regulation of water flows	2	342	342	481	2	682
11 Waste treatment / water purification	4	6	7	5	0	10
12 Erosion prevention	4	15	13	12	4	31
13 Nutrient cycling / maintenance of soil fertility	3	3	2	4	0	7
14 Pollination	2	30	30	33	6	53
15 Biological control	*1*	*11*	*11*		*11*	*11*
HABITAT SERVICES	**7**	**39**	**27**	**36**	**16**	**110**
16 Lifecycle maintenance (esp. nursery service)	*1*	*16*	*16*		*16*	*16*
17 Gene pool protection (conservation)	6	23	12	36	0	94
CULTURAL SERVICES	**20**	**867**	**45**	**1.908**	**0**	**7.793**
18 Aesthetic information						
19 Opportunities for recreation and tourism	20	867	45	1.908	0	7.793
20 Inspiration for culture, art and design						
21 Spiritual experience						
22 cognitive information (education and science)						

Table 7.2 List of used monetary values per service for Tropical forests

ESService		Value	Valuation Method	Country	Reference
1	Food	13	DMP	Indonesia	Van Beukering et al. (2003)
1	Food	2	DMP	Indonesia	Van Beukering et al. (2003)
1	Food	6	DMP	India	Verma (2000)
1	Food	39	DMP	Laos	Rosales et al. (2005)
1	Food	54	GV	Laos	Rosales et al. (2005)
1	Food	6	DMP	Bolivia	Godoy et al. (2002)
1	Food	4	DMP	Honduras	Godoy et al. (2002)
1	Food	597	DMP	Mexico	Adger et al. (1994)
1	Food	57	DMP	Cambodia	Bann (1997)
1	Food	58	DMP	Cambodia	Bann (1997)
1	Food	4	Other	Australia	Curtis (2004)
1	Food	17	RC	Paraguay	Naidoo and Ricketts (2006)
1	Food	1.021	DMP	Ecuador	Grimes et al. (1994)
1	Food	27	DMP	Malaysia	Kumari (1996)
1	Food	1.682	DMP	Peru	Pinedo-Vasquez et al. (1992)
1	Food	7	DMP	Cameroon	Yaron (2001)
1	Food	0	DMP	Cameroon	Ruitenbeek (1992)
1	Food	2	DMP	Cameroon	Ruitenbeek (1992)
2	Water	46	AC	Indonesia	Van Beukering et al. (2003)

2	Water	8	Other	Australia	Curtis (2004)
2	Water	28	DMP	Malaysia	Kumari (1996)
3	Raw materials	0	DMP	Indonesia	Van Beukering et al. (2003)
3	Raw materials	8	DMP	India	Verma (2000)
3	Raw materials	14	DMP	India	Verma (2000)
3	Raw materials	164	DMP	India	Verma (2000)
3	Raw materials	44	DMP	Laos	Rosales et al. (2005)
3	Raw materials	0	DMP	Indonesia	Van Beukering et al. (2003)
3	Raw materials	31	DMP	Cambodia	Bann (1997)
3	Raw materials	156	DMP	Cambodia	Bann (1997)
3	Raw materials	31	DMP	Cambodia	Bann (1997)
3	Raw materials	217	DMP	Cambodia	Bann (1997)
3	Raw materials	5	Other	Australia	Curtis (2004)
3	Raw materials	29	DMP	Paraguay	Naidoo and Ricketts (2006)
3	Raw materials	402	DMP	Peru	Pinedo-Vasquez et al. (1992)
3	Raw materials	39	DMP	Cameroon	Yaron (2001)
3	Raw materials	127	DMP	Malaysia	Kumari (1996)
4	Genetic	13	Other	Australia	Curtis (2004)
5	Medical	1.504	DMP	Cameroon	Yaron (2001)
7	Air quality	12	Other	Australia	Curtis (2004)
8	Climate	4	DMP	Indonesia	Van Beukering et al. (2003)
8	Climate	5.424	AC	Laos	Rosales et al. (2005)
8	Climate	101	DMP	Mexico	Adger et al. (1994)
8	Climate	12	Other	Australia	Curtis (2004)
8	Climate	401	DMP	Paraguay	Naidoo and Ricketts (2006)
8	Climate	8.104	AC	Malaysia	Kumari (1996)
8	Climate	261	AC	Cameroon	Yaron (2001)
9	Extreme events	29	AC	Indonesia	Van Beukering et al. (2003)
9	Extreme events	14	AC	Indonesia	Van Beukering et al. (2003)
9	Extreme events	390	AC	Laos	Rosales et al. (2005)
9	Extreme events	10	Other	Australia	Curtis (2004)
9	Extreme events	16	DMP	Cameroon	Yaron (2001)
9	Extreme events	1	AC	Cameroon	Ruitenbeek (1992)
9	Extreme events	1	FI / PF	Madagascar	Kramer et al. (1997)
10	Water flows	2	Other	Australia	Curtis (2004)
10	Water flows	682	FI / PF	Malaysia	Kumari (1996)
11	Waste	0	AC	Mexico	Adger et al. (1994)
11	Waste	6	DMP	Cambodia	Bann (1997)
11	Waste	10	Other	Australia	Curtis (2004)
11	Waste	9	Other	Australia	Curtis (2004)
12	Erosion	31	AC	Indonesia	Van Beukering et al. (2003)
12	Erosion	13	AC	Laos	Rosales et al. (2005)
12	Erosion	13	Other	Australia	Curtis (2004)
12	Erosion	4	AC	Cameroon	Yaron (2001)
13	Soil fertility	2	Other	Australia	Curtis (2004)
13	Soil fertility	7	Other	Australia	Curtis (2004)
13	Soil fertility	0	AC	Cameroon	Ruitenbeek (1992)
14	Pollination	6	Other	Australia	Curtis (2004)
14	Pollination	53	FI / PF	Indonesia	Priess et al. (2007)
15	BioControl	11	Other	Australia	Curtis (2004)
16	Nursery	16	Other	Australia	Curtis (2004)
17	Genepool	0	Other	Laos	Rosales et al. (2005)

17	Genepool	18	Other	Australia	Curtis (2004)
17	Genepool	17	Other	Australia	Mallawaarachchi et al. (2001)
17	Genepool	7	PES	Bolivia	Asquith et al. (2008)
17	Genepool	3	PES	Bolivia	Asquith et al. (2008)
17	Genepool	94	PES	Costa Rica	Pagiola et al. (2004)
19	Recreation	4	Other	Australia	Curtis (2004)
19	Recreation	116	TC	India	Gundimeda et al. (2006)
19	Recreation	36	CV	Madagascar	Kramer et al. (1995)
19	Recreation	2	CV	Uganda	Naidoo and Adamowicz (2005)
19	Recreation	3.838	CV	Costa Rica	Shultz et al (1998)
19	Recreation	14	TC	Costa Rica	Tobias and Mendelsohn (1991)
19	Recreation	518	CV	Costa Rica	Echeverria et al. (1995)
19	Recreation	53	DMP	Malaysia	Kumari (1996)
19	Recreation	9	DMP	Cameroon	Ruitenbeek (1992)
19	Recreation	0	CV	India	Gundimeda et al. (2006)
19	Recreation	2	CV	India	Gundimeda et al. (2006)
19	Recreation	4	TC	India	Gundimeda et al. (2006)
19	Recreation	19	TC	India	Gundimeda et al. (2006)
19	Recreation	118	TC	India	Gundimeda et al. (2006)
19	Recreation	184	TC	India	Gundimeda et al. (2006)
19	Recreation	1.243	Other	India	Gundimeda et al. (2006)
19	Recreation	2.456	Other	India	Gundimeda et al. (2006)
19	Recreation	7.793	TC	India	Gundimeda et al. (2006)
19	Recreation	13	TC	Madagascar	Kramer et al. (1995)
19	Recreation	925	CV	Costa Rica	Shultz et al (1998)

8. Temperate and Boreal Forests

This biome-type includes Temperate and Boreal forest, or taiga. Temperate forests can be sub-divided in temperate deciduous forest, temperate broadleaf and mixed forest, temperate coniferous forest, temperate rainforest.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 8.1 Monetary value of services provided by Temperate and Boreal Forests
(in Int. $/ha/year-2007 values)

Temperate forests	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**58**	**3.013**	**1.127**	**5.437**	**278**	**16.406**
PROVISIONING SERVICES	**9**	**671**	**450**	**867**	**121**	**1.593**
1 Food	2	299	299	422	0	597
2 (Fresh) water supply	3	191	121	123	118	333
3 Raw materials	4	181	31	322	2	662
4 Genetic resources						
5 Medicinal resources						
6 Ornamental resources						
REGULATING SERVICES	**13**	**491**	**367**	**584**	**105**	**1.212**
7 Influence on air quality						
8 Climate regulation	6	152	34	241	7	624
9 Moderation of extreme events						
10 Regulation of water flows						
11 Waste treatment / water purification	3	7	0	13	0	22
12 Erosion prevention	*1*	*5*	*5*		*5*	*5*
13 Nutrient cycling / maintenance of soil fertility	*1*	*93*	*93*		*93*	*93*
14 Pollination						
15 Biological control	2	235	235	330	1	469
HABITAT SERVICES	**10**	**862**	**171**	**1.342**	**51**	**3.573**
16 Lifecycle maintenance (esp. nursery service)						
17 Gene pool protection (conservation)	10	862	171	1.342	51	3.573
CULTURAL SERVICES	**26**	**990**	**139**	**2.644**	**1**	**10.028**
18 Aesthetic information						
19 Opportunities for recreation and tourism	25	989	138	2.644	1	10.027
20 Inspiration for culture, art and design						
21 Spiritual experience						
22 cognitive information (education and science)	*1*	*1*	*1*		*1*	*1*

Table 8.2 List of used monetary values per service for Temperate and Boreal Forests

ESService		Value	Valuation Method	Country	Reference
1	Food	0	DMP	Canada	Anielski and Wilson (2005)
1	Food	597	DMP	Mexico	Adger et al. (1994)
2	Water	118	FI / PF	Chile	Nunez et al. (2006)
2	Water	333	RC	China	Xue and Tisdell (2001)
2	Water	121	DMP	Portugal	Cruz and Benedicto (2009)
3	Raw materials	59	DMP	Canada	Anielski and Wilson (2005)
3	Raw materials	2	DMP	Samoa	Mohd-Shahwahid and McNally (2001)
3	Raw materials	2	DMP	Samoa	Mohd-Shahwahid and McNally (2001)
3	Raw materials	662	DMP	Eritrea	Emerton and Asrat (1998)
8	Climate	7	RC	Canada	Anielski and Wilson (2005)
8	Climate	23	DMP	Canada	Anielski and Wilson (2005)
8	Climate	186	DMP	Mexico	Adger et al. (1994)
8	Climate	36	DMP	Mexico	Adger et al. (1994)
8	Climate	624	MC / RC	China	Xue and Tisdell (2001)
8	Climate	33	RC	China	Xue and Tisdell (2001)
11	Waste	0	AC	Mexico	Adger et al. (1994)
11	Waste	0	AC	Mexico	Adger et al. (1994)
11	Waste	22	RC	Portugal	Cruz and Benedicto (2009)
12	Erosion	5	AC	China	Xue and Tisdell (2001)

13	Soil fertility	93	DMP	China	Xue and Tisdell (2001)
15	BioControl	469	RC	Sweden	Hougner et al. (2006)
15	BioControl	1	AC	China	Xue and Tisdell (2001)
17	Genepool	3.151	CV	Finland	Kniivila et al. (2002)
17	Genepool	3.573	CV	USA	Loomis and Ekstrand (1998)
17	Genepool	790	CV	Finland	Siikamäki and Layton (2007)
17	Genepool	68	CV	South Africa	Turpie (2003)
17	Genepool	130	CV	USA	Walsh et al. (1984)
17	Genepool	212	CV	Finland	Siikamäki and Layton (2007)
17	Genepool	487	CV	Finland	Siikamäki and Layton (2007)
17	Genepool	51	CV	USA	Walsh et al. (1984)
17	Genepool	67	CV	USA	Walsh et al. (1984)
17	Genepool	88	CV	USA	Walsh et al. (1984)
19	Recreation	1	CV	Samoa	Mohd-Shahwahid and McNally (2001)
19	Recreation	1	TC	Italy	Bellu and Cistulli (1997)
19	Recreation	9	CV	Sweden	Bostedt and Mattsson (2006)
19	Recreation	88	CV	Denmark	Dubgaard (1998)
19	Recreation	10.027	Other	Finland	Kniivila et al. (2002)
19	Recreation	169	CV	United Kingdom	Scarpa et al. (2000)
19	Recreation	429	CV	Ireland	Scarpa et al. (2000)
19	Recreation	9.398	CV	Netherlands	Van der Heide (2005)
19	Recreation	12	TC	Portugal	Cruz and Benedicto (2009)
19	Recreation	406	CV	Ireland	Scarpa et al. (2000)
19	Recreation	1.240	CV	Ireland	Scarpa et al. (2000)
19	Recreation	7	CV	Ireland	Scarpa et al. (2000)
19	Recreation	14	CV	Ireland	Scarpa et al. (2000)
19	Recreation	36	CV	Ireland	Scarpa et al. (2000)
19	Recreation	115	CV	Ireland	Scarpa et al. (2000)
19	Recreation	116	CV	Ireland	Scarpa et al. (2000)
19	Recreation	138	CV	Ireland	Scarpa et al. (2000)
19	Recreation	1.014	CV	Ireland	Scarpa et al. (2000)
19	Recreation	73	CV	United Kingdom	Scarpa et al. (2000)
19	Recreation	125	CV	United Kingdom	Scarpa et al. (2000)
19	Recreation	191	CV	United Kingdom	Scarpa et al. (2000)
19	Recreation	240	CV	United Kingdom	Scarpa et al. (2000)
19	Recreation	266	CV	United Kingdom	Scarpa et al. (2000)
19	Recreation	305	CV	United Kingdom	Scarpa et al. (2000)
19	Recreation	306	CV	United Kingdom	Scarpa et al. (2000)
22	Cognitive	1	TC	Portugal	Cruz and Benedicto (2009)

9. Woodlands

The “woodland-biome” includes a large range of vegetation types including savannas, shrublands, scrublands and chaparral interleaved with one another in mosaic landscape patterns distributed along the western coasts of North and South America, areas around the Mediterranean Sea, South Africa, and Australia, jointly representing about 5% of the planets surface.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used

for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 9.1 Monetary value of services provided by Woodlands
(in Int. $/ha/year-2007 values)

Woodlands	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**21**	**1.588**	**1.522**	**317**	**1.373**	**2.188**
PROVISIONING SERVICES	**13**	**253**	**184**	**313**	**35**	**843**
1 Food	5	52	1	115	0	258
2 (Fresh) water supply						
3 Raw materials	7	170	151	198	3	553
4 Genetic resources						
5 Medicinal resources						
6 Ornamental resources	*1*	*32*	*32*		*32*	*32*
REGULATING SERVICES	**3**	**51**	**56**	**0**	**56**	**56**
7 Influence on air quality						
8 Climate regulation	*1*	*7*	*13*		*13*	*13*
9 Moderation of extreme events						
10 Regulation of water flows						
11 Waste treatment / water purification						
12 Erosion prevention	*1*	*13*	*13*		*13*	*13*
13 Nutrient cycling / maintenance of soil fertility						
14 Pollination	*1*	*31*	*31*		*31*	*31*
15 Biological control						
HABITAT SERVICES	**4**	**1.277**	**1.275**	**4**	**1.274**	**1.282**
16 Lifecycle maintenance (esp. nursery service)	*1*	*1.273*	*1.273*		*1.273*	*1.273*
17 Gene pool protection (conservation)	3	3	1	4	1	8
CULTURAL SERVICES	**1**	**7**	**7**	**0**	**7**	**7**
18 Aesthetic information						
19 Opportunities for recreation and tourism	*1*	*7*	*7*		*7*	*7*
20 Inspiration for culture, art and design						
21 Spiritual experience						
22 cognitive information (education and science)						

Table 9.2 List of used monetary values per service for Woodlands

ESService		Value	Valuation Method	Country	Reference
1	Food	1	DMP	Tanzania	Turpie (2000)
1	Food	1	DMP	Tanzania	Turpie (2000)
1	Food	0	DMP	South Africa	Turpie(2003b)
1	Food	1	DMP	South Africa	Turpie(2003b)
1	Food	258	DMP	Peru	Rodriguez et al. (2006)
3	Raw materials	3	DMP	Tanzania	Turpie (2000)
3	Raw materials	12	DMP	Tanzania	Turpie (2000)
3	Raw materials	10	DMP	South Africa	Turpie(2003b)
3	Raw materials	269	DMP	Djibouti	Emerton (1998)
3	Raw materials	553	DMP	Peru	Rodriguez et al. (2006)
3	Raw materials	189	RC	Peru	Rodriguez et al. (2006)
3	Raw materials	151	DMP	Peru	Rodriguez et al. (2006)
6	Ornamental	32	DMP	Peru	Rodriguez et al. (2006)
8	Climate	7	DMP	Djibouti	Emerton (1998)
12	Erosion	13	CV	Peru	Rodriguez et al. (2006)
14	Pollination	31	FI / PF	South Africa	Turpie(2003b)

16	Nursery	1.273	RC	Peru	Rodriguez et al. (2006)
17	Genepool	8	CV	South Africa	Turpie(2003b)
17	Genepool	1	CV	South Africa	Turpie (2003)
17	Genepool	1	CV	Australia	Blamey et al. (2000)
19	Recreation	7	DMP	Senegal	Ba et al. (2006)

10. Grasslands

Grasslands occur in a wide variety of environments. They include tropical grasslands (savannas), temperate grasslands (including the European and Central Asian steppe and North American prairie), boreal grasslands (tundra's) and mountainous grasslands (such as the Latin American Paramo highlands). The largest continuous stretch of tropical grassland is the North African Sahel, that stretches from Senegal to the Horn of Africa.

In the two tables in this paragraph we provide 1) an overview of monetary values per ecosystem service of this biome and 2) a list of the monetary values which have been used for the calculations of this overview. For details on the variables please see the introduction of this Appendix / Supplement.

Table 10.1 Monetary value of services provided by Grasslands
(in Int. $/ha/year-2007 values)

Grasslands	No. of used Estimates	Mean Value (int$/ha/y)	Median Value (Int$/ha/y)	St Dev of values	Minimum Value (int$/ha/y)	Maximum Value (Int$/ha/y)
TOTAL:	**32**	**2.871**	**2.698**	**3.860**	**124**	**5.930**
PROVISIONING SERVICES	**12**	**1.305**	**1.299**	**1.717**	**71**	**2.551**
1 Food	2	1.192	1.192	1.647	27	2.357
2 (Fresh) water supply	3	60	53	23	41	85
3 Raw materials	6	53	53	47	2	108
4 Genetic resources						
5 Medicinal resources	*1*	*1*	*1*		*1*	*1*
6 Ornamental resources						
REGULATING SERVICES	**9**	**159**	**121**	**152**	**50**	**301**
7 Influence on air quality						
8 Climate regulation	5	40	2	55	0	113
9 Moderation of extreme events						
10 Regulation of water flows						
11 Waste treatment / water purification	2	75	75	89	13	138
12 Erosion prevention	2	44	44	8	38	49
13 Nutrient cycling / maintenance of soil fertility						
14 Pollination						
15 Biological control						
HABITAT SERVICES	**2**	**1.214**	**1.214**	**1.716**	**0**	**2.428**
16 Lifecycle maintenance (esp. nursery service)						
17 Gene pool protection (conservation)	2	1.214	1.214	1.716	0	2.428
CULTURAL SERVICES	**9**	**193**	**64**	**275**	**3**	**651**
18 Aesthetic information	5	167	44	248	1	591
19 Opportunities for recreation and tourism	4	26	20	26	2	60
20 Inspiration for culture, art and design						
21 Spiritual experience						
22 cognitive information (education and science)						

Table 10.2 List of used monetary values per service for Grasslands

ESService		Value	Valuation Method	Country	Reference
1	Food	2.357	DMP	Botswana	Barnes (2002)
1	Food	27	DMP	Botswana	Arntzen (1998)
2	Water	41	AC	New Zealand	Butcher Partners Limited (2006)
2	Water	85	AC	New Zealand	Butcher Partners Limited (2006)
2	Water	53	DMP	New Zealand	Butcher Partners Limited (2006)
3	Raw materials	4	FI / PF	Philippines	Predo (2003)
3	Raw materials	31	DMP	Netherlands	LNV (2006)
3	Raw materials	2	RC	Israel	Fleischer and Sternberg (2006)
3	Raw materials	75	RC	Israel	Fleischer and Sternberg (2006)
3	Raw materials	96	RC	Israel	Fleischer and Sternberg (2006)
3	Raw materials	108	RC	Israel	Fleischer and Sternberg (2006)
5	Medical	1	DMP	Uganda	Phillips (ed) (1998)
8	Climate	86	DMP	Philippines	Predo (2003)
8	Climate	113	CV	Netherlands	LNV (2006)
8	Climate	2	DMP	USA	Sala and Paruelo (1997)
8	Climate	0	AC	USA	Sala and Paruelo (1997)
8	Climate	1	AC	USA	Sala and Paruelo (1997)
11	Waste	138	RC	Netherlands	LNV (2006)
11	Waste	13	RC	Netherlands	LNV (2006)
12	Erosion	49	AC	Netherlands	LNV (2006)
12	Erosion	38	DMP	USA	Barrow (1991)
17	Genepool	0	CV	South Africa	Turpie (2003)
17	Genepool	2.428	CV	Netherlands	Brouwer and Slangen (1997)
18	Aesthetic	189	CV	Germany	Barkmann and Zschiegner (2010)
18	Aesthetic	591	CV	Germany	Barkmann and Zschiegner (2010)
18	Aesthetic	1	HP	Sweden	Juusola (2009)
18	Aesthetic	12	CV	United Kingdom	Alvarez-Farizo et al (1999)
18	Aesthetic	44	CV	United Kingdom	Alvarez-Farizo et al (1999)
19	Recreation	9	DMP	Botswana	Barnes (2002)
19	Recreation	60	TC	Kenya	Brown and Henry (1993)
19	Recreation	2	CV	South Africa	Cowling et al. (1997)
19	Recreation	31	DMP	Netherlands	LNV (2006)

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