

During a discussion of projects 7a and 7b on 27 June 2004, it was agreed that a calculation of the carbon emission from the fish farms will be added as an Appendix to this report.

Appendix 1: Carbon emission from the fish cages

In their report for this project Lazar and Erez calculated the amounts of carbon that were emitted from the fish cages since 1992 and available for oxidation. Their estimate of the total carbon emission was **33,000 ton**.

Here we present the calculations of the carbon emission from the cages made by I. Lupatsch (National Center for Mariculture) on the basis of measurements of the digestibility of the fish feed using the methodology outlined in Lupatsch (2003) (ref. below). The calculation is presented below:

Year	Feed in T	Yield in T	FCR	C in Feed, Ton	retained in fish	C to water, Ton or Mol		total	
					C	solid	dissolved	C	
1992	495	150	3.3	211	35.7	31.70	144.0	175.7	ton
1993	900	300	3.0	384	71.4	57.65	255.3	312.9	ton
1994	1350	450	3.0	576	107.1	86.47	382.9	469.4	ton
1995	2100	700	3.0	920	166.6	137.97	615.2	753.2	ton
1996	2901	967	3.0	1271	230.1	190.60	849.9	1040.5	ton
1997	3672	1224	3.0	1608	291.3	241.25	1075.8	1317.0	ton
1998	4506	1530	2.95	1974	364.1	296.04	1313.4	1609.5	ton
1999	5009	2006	2.50	2194	477.4	329.09	1387.4	1716.5	ton
2000	4758	2417	1.97	2117	575.2	317.60	1224.5	1542.1	ton
2001	4666	2803	1.66	2076	667.1	311.46	1097.8	1409.3	ton
2002	4352	2363	1.84	1937	562.4	290.50	1083.8	1374.2	ton
2003	4352	2363	1.84	1937	562.4	290.50	1083.8	1374.2	ton
				total	4111	2581	10514	13094	ton

The total amount of carbon emitted from the cages since 1992 was 13,094 ton. However, most of this carbon (almost all the dissolved fraction) was in the form of CO₂ emitted during respiration. The total amount of carbon in the solid waste (available for oxidation) was **2,581 ton**, i.e. ~ 8% of the amount calculated by Lazar and Erez.

Lupatsch, I. (2003). Predicting nutrient flow in integrated aquaculture systems using a nutritional approach.... Abstracts of contributions presented at the International Conference Aquaculture Europe 2003, Trondheim, Norway. EAS Special Publication, no. 33, 251-252