

QUESTIONS FOR THE ENVIRONMENTAL FOOTPRINT ASSIGNMENT

(THIS FILE SHOULD BE ***SUBMITTED AS A WORD. DOC OR WORD.DOCX FILE***; IF YOU USE A MAC, YOU WILL NEED TO SAVE IT AS FILE THAT WILL OPEN IN WINDOWS WORD.

1.) There are approximately 7,000,000,000 people on earth. If everyone on earth consumed the same amount of materials as you do, could the earth support them all? **SHOW YOUR CALCULATIONS!**

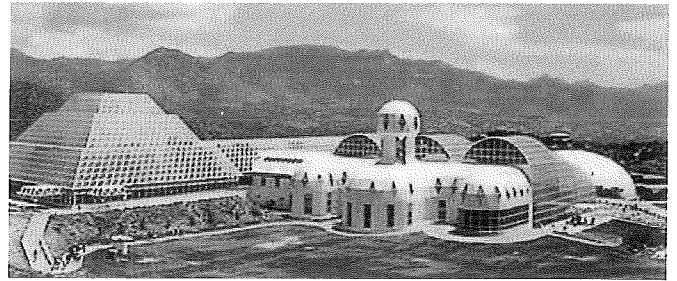
Helpful information:

Land area on earth = 150,000,000 km²

100 hectares (ha) = 1km² (SO, divide your footprint (in hectares) by 100 to get your footprint in km². Then what??? (HINT: Your footprint x # of people compared to...)

3.) Between 1984 and 1991, Columbia University Biosphere 2 Center was built in Oracle, Arizona, at a cost of over \$200 million. Biosphere 2 was a giant glass chamber sealed off from the atmosphere that contained living ecosystems including a tropical rainforest, ocean, savannah, desert, marsh, and agricultural landscape. It enclosed 13,000m² of land and a total volume of 204,000m³.

The original test of Biosphere 2 attempted to determine if these ecosystems could support the lives of eight people in perpetuity. Their only source of food was what they could grow in the agricultural sector. Their only source of oxygen was from plants and algae in the terrestrial and oceanic ecosystems. In 1991, the eight researchers were sealed in Biosphere 2, and the world watched.¹



Imagine you are a team of senior research scientists at the initial planning phase of Biosphere 2. What size footprint per person (in hectares) would be required so that Biosphere 2 could support eight people? (GIVEN: 13,000m² land area/8 people; then convert m²/per person to ha per person (1 m² = 0.0001 ha). How many acres of land is this? (1 ha = 2.47 acres). **SHOW YOUR CALCULATIONS!**

What kinds of specific conditions would be needed in Biosphere 2 to make it possible to sustain eight people for the rest of their lives? Should the people living in the Biosphere eat a diet including meat or a vegetarian diet? Why? Should people drive cars? What plants and animals should be included?

¹ from **Philip Camill**, Department of Biology, Carleton College
(<http://ublib.buffalo.edu/libraries/projects/cases/footprint/footprint.html>)

Assess your Household's Ecological Footprint

First, choose whether you want to work with metric or US measurements.

S : put "m" for metric, "s" for US standard

Second, register your monthly consumption in column D (or your yearly consumption in column E). Optional: put the dollar amounts into column F.

Number of people in the household: 1

(land and sea space in square meters)

CATEGORIES	Units	AMOUNT per month	eqv. amount per year	Dollars spent (mth)	(I) FOSSIL ENERGY	(II) ARABLE LAND	(III) PASTURE	(IV) FOREST	(V) BUILT-UP LAND	(VI) SEA
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1-FOOD

Enter percentage of food purchased that is wasted rather than eaten in your household.
How much of the food that you buy is locally grown, unprocessed and in-season?

26% (26 percent is the national average)
b Most food we buy is packaged, out of season and from far away.
a About a quarter
c About half
d About three quarters
e Most all the food we get is locally grown, unprocessed, and in-season.

Veggies, potatoes & fruit	[pounds]	48.7	584	\$32.90	400	241				
Bread and bakery products	[pounds]	7.8	94	\$6.70	160	254				
Flour, rice, noodles, cereal products	[pounds]	8.9	107	\$8.90	146	198				
Beans and other dried pulses	[pounds]	0.7	8	\$0.80	6	54				
Milk, cream, yogurt, sour cream	[quarts]	9.1	109	\$9.00	156		3,294			
Ice cream, other frozen dairy	[quarts]	1.2	14	\$0.90	41		2,172			
Cheese, butter	[pounds]	2.7	32	\$2.60	144		4,690			
Eggs (assumed to be 50 g each)	[number]	20	240	\$24.00	45	152				
Meat										
..Pork	[pounds]	3.8	46	\$3.80	312	180				
..Chicken, turkey	[pounds]	5.4	65	\$5.20	355	302				
..Beef (grain fed)	[pounds]	5.4	65	\$5.40	576	1,240	9,439			
..Beef (pasture fed)	[pounds]	4.7	56	\$4.50	502		11,736			
Fish	[pounds]	1.2	14	\$1.20	148					3,100
Sugar	[pounds]	5.5	66	\$5.50	0	71				
Vegetable oil & fat										
..solid	[pounds]	2.5	30	\$2.40	0	389				
..liquid	[quarts]	1.2	14	\$1.20	0	311				
Coffee & tea	[pounds]	0.8	10	\$0.50	0	69				
Juice & wine	[quarts]	3.0	36	\$2.80	128	84				
Beer	[quarts]	7.3	88	\$8.00	312	137				
Garden (area used for food)	[sq ft]	0.0	0	\$88.00	1,244	955	8,120			
Eating out	[\$]	86	1032	\$86.00	4,675	4,638	39,450	0	0	3,100
SUB-TOTAL-1				\$214.30						
2-HOUSING										
..House (living area)										
..wooden house (US standard)	[sq ft]	582	582	\$198.00	693			1,800		
..brick house	[sq ft]	395	395	\$245.00	269			1,221		
Yard (or total lot size incl. building)	[sq ft]	15246	15246	\$819.00					1,416	
Hotels, Motels	[\$]	464	5568	\$464.00	5,682					
Electricity (also check composition--see note [kWh])		323	3876	\$120.00						
enter as fraction, ex. 25% = 0.25										
..thermally produced (fossil and nuclear)		88%			5,607					

5.-SERVICES

Postal services									
..international	[pounds]	0.2	2	\$0.18	7				3
..domestic	[pounds]	4	48	\$3.90	30				11
Dry cleaning or external laundry service	[\$]	2	24	\$2.00	20				8
Telephone	[\$]	27	324	\$27.00	44				17
Medical insurance and services	[\$]	47	564	\$47.00	309				119
Household insurance	[\$]	27	324	\$27.00	74			334	29
Entertainment	[\$]	24	288	\$24.00	237				91
Education	[\$]	20	240	\$20.00	99				38
SUB-TOTAL-5				\$151.08	820	0	0	334	315
6.- WASTE (assuming everything compostable is composted, and waste = packaging)									

Household waste:									
..paper and paperboard	[pounds]	21	252	\$20.15	743	42%		1,206	91
..aluminum	[pounds]	1	12	\$0.50	137	28%			17
..other metal	[pounds]	2	24	\$1.80	85	35%			10
..glass	[pounds]	5	60	\$5.00	52	26%			6
..plastic	[pounds]	5	60	\$4.20	180	5%			22
SUB-TOTAL-6		34.0	408	\$31.65	1196	0	0	1206	147
enter percentage recycled in your household:									

CORRECTION FACTORS FOR THE U.S.	I) FOSSIL	II) ARABLE	III) PASTURE	IV) FOREST	V) BUILT-UP	VI) SEA
1.-FOOD	1.13	0.91	1.11			3.53
2.-HOUSING	0.84			1.42	1.73	
3.-TRANSPORTATION	0.91				1.94	
4.-GOODS	3.70	1.49	1.16	1.82		
5.-SERVICES	6.53			5.38		
6.-WASTE	3.70			1.82		
U.S. average fossil fuel area of	goods: 1324	services: 807		waste: 1196		

	Equivalence Factors	Unadjusted Footprint
I) FOSSIL	1.8	52,743
II) ARABLE	2.5	4,438
III) PASTURE	0.4	60,793
IV) FOREST	1.8	15,321
V) BUILT-UP	3.6	4,177
VI) SEA	0.1	10,934
TOTAL	-	148,406

Ecological Footprint Assessment: The Results

Your per capita footprint is 17 hectares.

This corresponds to 43 acres.

The Ecological Footprint per household member (presented as a land-use consumption matrix)

expressed in average land with world average productivity [in square meters]

CATEGORIES	I) FOSSIL ENERGY I.D.	II) ARABLE LAND	III) PASTURE	IV) FOREST	V) BUILT-UP LAND	VI) SEA	TOTAL
1.-FOOD	10,059	14,963	16,375	0	0	677	42,073
2.-HOUSING	29,856	0	0	19,299	9,070	0	58,224
3.-TRANSPORTATION	24,200	0	0	0	3,500	0	27,700
4.-GOODS	9,791	783	6,273	553	609	0	18,009
5.-SERVICES	10,167	0	0	3,153	1,118	0	14,438
6.-WASTE	8,402	0	0	3,858	522	0	12,782
TOTAL	92,475	15,746	22,648	26,863	14,819	677	173,227

Ecological Footprint distribution

CATEGORIES	I) FOSSIL ENERGY I.D.	II) ARABLE LAND	III) PASTURE	IV) FOREST	V) BUILT-UP LAND	VI) SEA	TOTAL
1.-FOOD	6%	9%	9%	0%	0%	0%	24%
2.-HOUSING	17%	0%	0%	11%	5%	0%	34%
3.-TRANSPORTATION	14%	0%	0%	0%	2%	0%	16%
4.-GOODS	6%	0%	4%	0%	0%	0%	10%
5.-SERVICES	6%	0%	0%	2%	1%	0%	8%
6.-WASTE	5%	0%	0%	2%	0%	0%	7%
TOTAL	53%	9%	13%	16%	9%	0%	100%