Supplementary Document

Table S1: Variables used in this study as well as their indicators and sources

Sustainability pillars	Variables	Indicators	Acronym for indicators	Method of measurement	Data source
Environmental	Biodiversity and Habitat	Total area of all Marine Protected Areas in a country	AMP	The percentage of a country's total exclusive economic zone (EEZ) designated as marine protected areas (MPAs)	URL: http://www.protectedplanet.net
		Protected Areas Representativeness Index	PAR	The proportion of biologically scaled environmental diversity included in a country's terrestrial protected areas.	Source: Commonwealth Scientific and Industrial Research Organization URL: https://data.csiro.au/
		Species Habitat Index	SHI	The proportion of suitable habitat within a country that remains intact for each species in that country relative to a baseline set in the year 2001.	Source: Map of Life URL: https://mol.org/indicators/
		Species Protection Index	SPI	The proportion of the country's protected area network that is suitable for specified 30 000 terrestrial vertebrate, invertebrate, and plant species.	Source: Map of Life URL: https://mol.org/indicators
		FSS Fish stock status [%]	FSS	The percentage of a country's total catch that comes from	Source: Sea Around Us URL: http://www.seaaroundus.org/

				overexploited or collapsed stocks, considering all fish stocks within a country's EEZs.	
		Fish catch [tonnes]	CTH	Fish catch [tonnes].	Source: Sea Around Us URL: http://www.seaaroundus.org/
		Terrestrial protected areas	TPA	% of total land area that are totally or partially protected areas of at least 1,000 hectares that are designated by national authorities as scientific reserves with limited public access, national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, and areas managed mainly for sustainable use.	Source World Database on Protected Areas
		Wetland area [km2]	WTA	Total Wetland area [km2].	Source: European Space Agency URL: https://maps.elie.ucl.ac.be/CCI/viewer/
		Grassland area [km2]	GRA	Total Grassland area [km2].	Source: European Space Agency URL: https://maps.elie.ucl.ac.be/CCI/viewer/
	Air pollution	Black Carbon Emissions [Gg	BLC	Black Carbon Emissions [Gg].	URL: https://www.geosci-model-dev.net/11/369/2018/gmd-11-369-2018.html
		SO2 emissions [Gg]	SO2	SO2 emissions [Gg]	Source: Community Emissions Data Systems URL: https://zenodo.org/record/3606753
		CO2 emissions from land cover change	CDL	CO2 emissions [Gg] from land cover change	Source: Mullion Group URL: https://flintpro.com/Global-Run
		Methane emissions [Gg]	CH4	Total Methane emissions [Gg]	Source: Potsdam Institute for Climate Impact Research URL: http://dataservices.gfzpotsdam.de/pik/showshort.php?id=escidoc:4736895
		Fluorinated-gasses emissions [Gg CO2-eq.]	FOG	Fluorinated gasses emissions [Gg CO2-eq.]	Source: Potsdam Institute for Climate Impact Research URL: http://dataservices.gfzpotsdam.de/pik/showshort.php?id=escidoc:4736895

		N2O emissions [Gg]	NOT	N2O emissions [Gg]	Source: Potsdam Institute for Climate Impact Research URL: http://dataservices.gfzpotsdam.de/pik/showshort.php?id=escidoc:4736895
		NOx emissions [Gg]	NOX	NOx emissions [Gg]	Source: Community Emissions Data Systems URL: https://zenodo.org/record/3606753
	Environmental Management	Sustainable Nitrogen Management Index	SNM	The balance between the efficient application of nitrogen fertilizer with maximum crop yields as a measure of the environmental performance of agricultural production.	Source: University of Maryland Center for Environmental Science URL: http://research.al.umces.edu/xzhang/
Social	Governance	Control of Corruption	CCO	Measures the perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	URL: https://databank.worldbank.org/source/worldwide-governanceindicators
		Government Effectiveness	GOE	Measures the perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	Source: Worldwide Governance Indicators URL: https://databank.worldbank.org/source/worldwide-governanceindicators

		Rule of Law	ROL	Measures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	Source: Worldwide Governance Indicators URL: https://databank.worldbank.org/source/worldwide-governanceindicators
		Regulatory Quality	RQU	Measures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	Source: Worldwide Governance Indicators URL: https://databank.worldbank.org/source/worldwide-governanceindicators
		Political Stability and the Absence of Violence	SAV	Measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.	Source: Worldwide Governance Indicators URL: https://databank.worldbank.org/source/worldwide-governanceindicators
		Voice and Accountability	VOA	Measures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	Source: Worldwide Governance Indicators URL: https://databank.worldbank.org/source/worldwide-governanceindicators

Economic	Economy	Services, value added (% of GDP)	SEG	Services, value added (% of GDP): Services correspond to ISIC divisions 50-99 and they include value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services, imputed bank service charges, and import duties.	Source: World Bank URL: https://databank.worldbank.org/source/world-development-indicators
		Total area of all Economic Exclusion Zones in a country	EEZ	Total area of all Economic Exclusion Zones in a country.	Source: World Database on Protected Areas URL: http://www.marineregions.org/
		GDP [PPP, USD2011]	GDP	Gross Domestic Product (USING 2011$)	URL: https://databank.worldbank.org/data/source/world-developmentindicators# AND https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/index
		Index of Economic Freedom	IEF	Measures four pillars of economic freedom including rule of law, government size, regulatory efficiency, and open markets.	Source: Heritage Foundation URL: https://www.heritage.org/index/explore

Table S3: The results of the stepwise regression with population as the response variable (Indicator Selection Method 1). *Indicators in red are selected as an indicator for each predictor variable; p-values highlighted in green are significant as per our chosen threshold ($p<0.05$).

Indicator	Full name	Predictor Variable	Pillar/Aspect of sustainability	Estimate	Std. Error	t value	Pr(>|t|)	AIC	Residual deviance (RD)	Degrees of freedom (DF)
AMP	Marine Protected Area	Biodiversity and Habitat	Environment	0,6782	0,1389	4,884	3,81E-05	71,634	15,66	28
PAR	Protected Areas		Environment	0,2832	0,1812	1,563	0,129	87,611	26,674	28
SHI	Species Habitat Index		Environment	-0,3465	0,1773	-1,955	0,0607	86,282	25,518	28
SPI	**Species Protection Index**		Environment	0,9567	0,055	17,39	2E-16	16,064	2,4566	28
FSS	Fish Stock		Environment	-5,47E-01	1,58E-01	-3,453	0,0017	79,475	20,338	28
CTH	Fish Catch		Environment	-1,04E-02	1,89E-01	-0,055	0,957	90,116	28,997	28
TPA	Terrestrial Protected Areas		Environment	1,09E-01	1,88E-01	0,58	0,566	89,761	28,656	28
WTA	Wetland Area		Environment	8,09E-01	1,11E-01	7,279	6,33E-08	58,256	10,026	28
GRA	Grassland Area		Environment	5,79E-01	1,54E-01	3,762	0,000793	77,848	19,264	28
CH4	**Methane emissions**	Air pollution	Environment	9,01E-01	8,21E-02	10,98	1,18E-11	40,063	5,4671	28
FOG	Fluorinated Gases emissions		Environment	8,80E-01	8,97E-02	9,819	1,44E-10	45,379	6,5271	28
NOT	N2O Emissions		Environment	-3,07E-01	1,80E-01	-1,705	0,0993	87,157	26,273	28
NOX	NOX Emissions		Environment	8,51E-01	9,93E-02	8,568	2,60E-09	51,512	8,0077	28
BLC	Black Carbon emissions		Environment	0,7674	0,1212	6,333	7,5E-07	63,45	11,921	28
SO2	Sulphur dioxide emissions		Environment	0,7318	1,29E-01	5,682	4,33E-06	67,115	13,47	28
CDL	CO2 from, land cover changes		Environment	1,41E-02	1,89E-01	0,075	9,41E-01	90,113	28,994	28
SNM	**Sustainable Nitrogen Management**	Environmental Management	Environment	-8,21E-01	1,08E-01	-7,611	2,73E-08	56,479	9,4494	28
CCO	**Control on Corruption**	Governance	Social	-8,00E-01	1,14E-01	-7,046	1,16E-07	59,523	10,459	28
GOE	Government Effectiveness		Social	-8,23E-01	1,07E-01	-7,672	2,34E-08	56,155	9,3479	28
ROL	Rule of Law		Social	-5,12E-01	1,62E-01	-3,158	0,00379	80,981	21,385	28
RQU	Regulatory Quality		Social	-3,50E-01	1,77E-01	-1,978	0,0579	86,196	25,445	28
SAV	Political Stability and Absence of Violence		Social	5,49E-01	1,58E-01	3,473	0,00169	79,371	20,268	28
VOA	Voice and Accountability		Social	-6,96E-01	1,36E-01	-5,131	1,94E-05	70,236	14,947	28
SEG	Services, value added	Economy	Economy	7,94E-01	1,15E-01	6,913	1,63E-07	60,247	10,714	28
EEZ	Area of economic exclusion zone		Economy	-3,40E-01	1,78E-01	-1,91	0,0664	86,444	25,656	28

GDP	**Gross Domestic Product**		Economy	9,78E-01	3,92E-02	24,97	<2e-16	-4,2861	1,2466	28
IEF	Economic Freedom		Economy	-1,29E-01	1,87E-01	-0,688	0,497	89,617	28,518	28

Table S4: The pairwise regression of indicators for each variable (Indicator Selection Method 2). The indicators highlighted in yellow were selected for further analysis using SEM, and the regression coefficients that are written in bold are considered to be strongly significant (coefficient ≥0.5).

Air pollution Indicators							
	BLC	SO2	CDL	CH4	FOG	NOT	NOX
BLC	1	**0.6681889**	0.04880521	**0.77049**	**0.72389225**	-0.4198329	**0.6676694**
SO2	**0.66818892**	1	-0.30105113	**0.8205614**	**0.76369718**	-0.2811769	**0.8113439**
CDL	0.04880521	-0.3010511	1	-0.203597	-0.02501129	-0.3991518	-0.1680452
CH4	**0.77048998**	**0.8205614**	-0.20359702	1	**0.85927413**	-0.370585	**0.7572416**
FOG	**0.72389225**	**0.7636972**	-0.02501129	**0.8592741**	1	-0.4290967	**0.8327023**
NOT	-0.41983293	-0.2811769	-0.39915184	-0.370585	-0.42909671	1	-0.3180247
NOX	**0.66766941**	**0.8113439**	-0.1680452	**0.7572416**	**0.83270235**	-0.3180247	1

Biodiversity and Habitat Indicators									
	AMP	PAR	SHI	SPI	FSS	CTH	TPA	WTA	GRA
AMP	1	0.25616997	-0.45011284	**0.9224439**	-0.3746685	0.02337628	**0.86058643**	**0.73665528**	0.2501081
PAR	0.25616997	1	-0.48811425	0.1953631	0.2658486	0.10170223	0.18979752	0.06956712	-0.2167721
SHI	-0.45011284	-0.48811425	1	-0.2671564	-0.1817698	-0.07770803	-0.4483571	-0.39247833	0.1985913
SPI	**0.9224439**	0.1953631	-0.26715635	1	-0.4738367	-0.0135797	**0.80607477**	**0.70571227**	0.3652156
FSS	-0.3746685	0.26584863	-0.18176979	-0.4738367	1	-0.49665851	-0.3342241	-0.60980502	-0.9068524
CTH	0.02337628	0.10170223	-0.07770803	-0.0135797	-0.4966585	1	-0.0596616	0.2198953	**0.535591**
TPA	**0.86058643**	0.18979752	-0.44835708	**0.8060748**	-0.3342241	-0.05966163	1	**0.64302436**	0.2322682
WTA	**0.73665528**	0.06956712	-0.39247833	**0.7057123**	-0.609805	0.2198953	**0.64302436**	1	**0.5680856**
GRA	0.25010808	-0.21677205	0.19859135	0.3652156	-0.9068524	**0.53559098**	0.23226819	**0.56808558**	1

Economy indicators				
	SEG	**EEZ**	**GDP**	**IEF**
SEG	1	-0.6994902	**0.8716323**	-0.277592
EEZ	-0.6994902	1	-0.6757837	0.2236042
GDP	**0.8716323**	-0.6757837	1	-0.2397507
IEF	-0.277592	0.2236042	-0.2397507	1

Governance indicators						
	CCO	GOE	ROL	RQU	SAV	VOA
CCO	1	**0.7989289**	0.12678412	0.29321883	-0.77150961	**0.8470066**
GOE	**0.7989289**	1	0.1938867	**0.5311315**	-0.62273698	**0.6834758**
ROL	0.1267841	0.1938867	1	0.03244871	-0.08411545	0.2653638
RQU	0.2932188	**0.5311315**	0.03244871	1	-0.02357546	0.2049624
SAV	-0.7715096	-0.622737	-0.08411545	-0.02357546	1	-0.8140394
VOA	**0.8470066**	**0.6834758**	0.26536379	0.20496242	-0.81403943	1

Table S5: AIC and BIC values for each of the 135 SEMs resulting from the selected indicator combinations in Figure S2.

N° combinations of indicators	Air Pollution	Biodiversity and Habitat	Economy	Governance	Akaike (AIC)	Bayesian (BIC)
1	CH4	WTA	GDP	GOE	207.809	228.827
2	CH4	WTA	GDP	ROL	229.516	250.534
3	CH4	WTA	IEF	GOE	310.707	331.725
4	CH4	WTA	IEF	ROL	332.749	353.767
5	CH4	PAR	GDP	GOE	254.285	275.302
6	CH4	PAR	GDP	ROL	278.660	299.678
7	CH4	PAR	IEF	GOE	353.848	374.866
8	CH4	PAR	IEF	ROL	374.731	395.749
9	CH4	SHI	GDP	GOE	241.961	262.979
10	CH4	SHI	GDP	ROL	268.925	289.943
11	CH4	SHI	IEF	GOE	349.857	370.875
12	CH4	SHI	IEF	ROL	378.005	399.023
13	CH4	CTH	GDP	GOE	259.161	280.179
14	CH4	CTH	GDP	ROL	283.286	304.304
15	CH4	CTH	IEF	GOE	348.953	369.971
16	CH4	CTH	IEF	ROL	370.670	391.688
17	CDL	WTA	GDP	GOE	265.952	286.970
18	CDL	WTA	GDP	ROL	296.912	317.930
19	CDL	WTA	IEF	GOE	369.434	390.452
20	CDL	WTA	IEF	ROL	399.998	421.016
21	CDL	PAR	GDP	GOE	304.460	325.478
22	CDL	PAR	GDP	ROL	335.975	356.993
23	CDL	PAR	IEF	GOE	398.885	419.903
24	CDL	PAR	IEF	ROL	426.315	447.333
25	CDL	SHI	GDP	GOE	293.582	314.600
26	CDL	SHI	GDP	ROL	327.330	348.348
27	CDL	SHI	IEF	GOE	396.168	417.186
28	CDL	SHI	IEF	ROL	396.168	417.186
29	CDL	CTH	GDP	GOE	310.326	331.344
30	CDL	CTH	GDP	ROL	342.501	363.519
31	CDL	CTH	IEF	GOE	396.067	417.085
32	CDL	CTH	IEF	ROL	425.192	446.210
33	NOT	WTA	GDP	GOE	250.926	271.944
34	NOT	WTA	GDP	ROL	283.576	304.594
35	NOT	WTA	IEF	GOE	360.028	381.046
36	NOT	WTA	IEF	ROL	393.213	414.231
37	NOT	PAR	GDP	GOE	286.921	307.939
38	NOT	PAR	GDP	ROL	321.098	342.116

39	NOT	PAR	IEF	GOE	394.193	415.211
40	NOT	PAR	IEF	ROL	429.020	450.038
41	NOT	SHI	GDP	GOE	275.485	296.503
42	NOT	SHI	GDP	ROL	311.547	332.565
43	NOT	SHI	IEF	GOE	384.286	405.304
44	NOT	SHI	IEF	ROL	422.457	443.475
45	NOT	CTH	GDP	GOE	292.349	313.367
46	NOT	CTH	GDP	ROL	326.022	347.040
47	NOT	CTH	IEF	GOE	386.928	407.946
48	NOT	CTH	IEF	ROL	422.799	443.817
49	CDL	PAR	GDP	SAV	312.499	333.517
50	CDL	PAR	IEF	SAV	418.835	439.853
51	CDL	PAR	EEZ	GOE	398.126	419.144
52	CDL	PAR	EEZ	ROL	424.595	445.612
53	CDL	PAR	EEZ	SAV	419.222	440.24
54	CDL	SHI	GDP	SAV	307.949	328.967
55	CDL	SHI	IEF	SAV	423.548	444.566
56	CDL	SHI	EEZ	GOE	390.619	411.637
57	CDL	SHI	EEZ	ROL	420.433	441.451
58	CDL	SHI	EEZ	SAV	418.513	439.531
59	CDL	FSS	GDP	GOE	286.987	308.005
60	CDL	FSS	GDP	ROL	317.822	338.84
61	CDL	FSS	GDP	SAV	317.822	338.84
62	CDL	FSS	IEF	GOE	378.84	399.858
63	CDL	FSS	IEF	ROL	405.625	426.643
64	CDL	FSS	EEZ	GOE	383.503	404.521
65	CDL	FSS	EEZ	ROL	411.154	432.172
66	CDL	FSS	EEZ	SAV	408.542	429.56
67	CDL	FSS	IEF	SAV	408.542	429.56
68	CDL	CTH	GDP	SAV	323.688	344.706
69	CDL	CTH	IEF	SAV	418.923	439.941
70	CDL	CTH	EEZ	GOE	406.336	427.354
71	CDL	CTH	EEZ	ROL	433.558	454.576
72	CDL	CTH	EEZ	SAV	431.59	452.608
73	CDL	WTA	GDP	SAV	274.327	295.345
74	CDL	WTA	IEF	SAV	374.778	395.796
75	CDL	WTA	EEZ	GOE	368.611	389.629
76	CDL	WTA	EEZ	ROL	396.465	417.483
77	CDL	WTA	EEZ	SAV	380.691	401.709
78	CH4	PAR	GDP	SAV	252.876	273.894
79	CH4	PAR	IEF	SAV	360.405	381.423
80	CH4	PAR	EEZ	GOE	351.449	372.467
81	CH4	PAR	EEZ	ROL	369.28	390.298
82	CH4	PAR	EEZ	SAV	358.315	379.333

83	CH4	SHI	GDP	SAV	247.729	268.747
84	CH4	SHI	IEF	SAV	364.814	385.832
85	CH4	SHI	EEZ	GOE	343.115	364.133
86	CH4	SHI	EEZ	ROL	366.081	387.099
87	CH4	SHI	EEZ	SAV	424.983	446.001
88	CH4	FSS	GDP	GOE	234.021	255.039
89	CH4	FSS	GDP	ROL	256.424	277.442
90	CH4	FSS	GDP	SAV	235.007	256.025
91	CH4	FSS	IEF	GOE	332.875	353.893
92	CH4	FSS	IEF	ROL	352.712	373.73
93	CH4	FSS	IEF	SAV	340.184	361.202
94	CH4	FSS	EEZ	GOE	338.056	359.074
95	CH4	FSS	EEZ	ROL	358.28	379.297
96	CH4	FSS	EEZ	SAV	358.28	379.297
97	CH4	CTH	GDP	SAV	262.733	283.751
98	CH4	CTH	IEF	SAV	356.709	377.727
99	CH4	CTH	EEZ	GOE	358.98	379.998
100	CH4	CTH	EEZ	ROL	377.22	398.238
101	CH4	CTH	EEZ	SAV	368.648	389.666
102	CH4	WTA	GDP	SAV	209.831	230.849
103	CH4	WTA	IEF	SAV	311.589	332.607
104	CH4	WTA	EEZ	GOE	308.292	329.31
105	CH4	WTA	EEZ	ROL	327.016	348.034
106	CH4	WTA	EEZ	SAV	312.948	333.966
107	NOT	PAR	GDP	SAV	295.195	316.213
108	NOT	PAR	IEF	SAV	419.522	440.54
109	NOT	PAR	EEZ	GOE	388.724	409.742
110	NOT	PAR	EEZ	ROL	419.558	440.576
111	NOT	PAR	EEZ	SAV	413.356	434.374
112	NOT	SHI	GDP	SAV	290.543	311.561
113	NOT	SHI	IEF	SAV	420.208	441.226
114	NOT	SHI	EEZ	GOE	376.823	397.841
115	NOT	SHI	EEZ	ROL	409.717	430.735
116	NOT	SHI	EEZ	SAV	409.717	430.735
117	NOT	FSS	GDP	GOE	278.639	299.657
118	NOT	FSS	GDP	ROL	311.211	332.229
119	NOT	FSS	GDP	SAV	283.774	304.792
120	NOT	FSS	IEF	GOE	377.465	398.483
121	NOT	FSS	IEF	ROL	410.223	431.241
122	NOT	FSS	IEF	SAV	402.265	423.283
123	NOT	FSS	EEZ	GOE	377.515	398.533
124	NOT	FSS	EEZ	ROL	407.168	428.186
125	NOT	FSS	EEZ	SAV	405.686	426.704
126	NOT	CTH	GDP	SAV	305.212	326.23

127	NOT	CTH	IEF	SAV	420.603	441.621
128	NOT	CTH	EEZ	GOE	393.174	414.192
129	NOT	CTH	EEZ	ROL	423.648	444.666
130	NOT	CTH	EEZ	SAV	425.521	446.539
131	NOT	WTA	GDP	SAV	256.99	278.008
132	NOT	WTA	IEF	SAV	366.205	387.223
133	NOT	WTA	EEZ	GOE	358.966	379.984
134	NOT	WTA	EEZ	ROL	387.863	408.881
135	NOT	WTA	EEZ	SAV	373.948	394.966

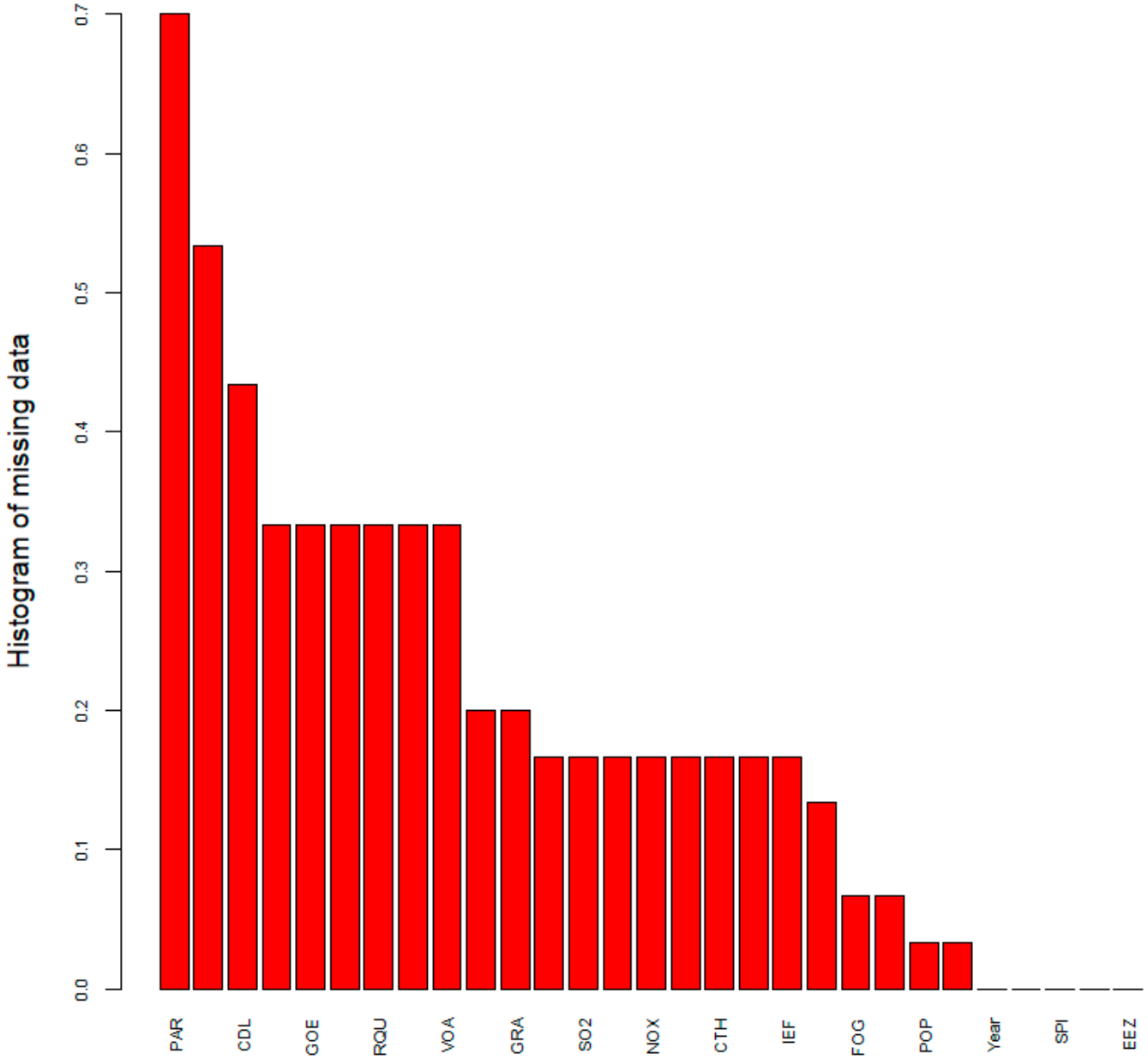


Figure S1: Distribution and Pattern of Missing Data.

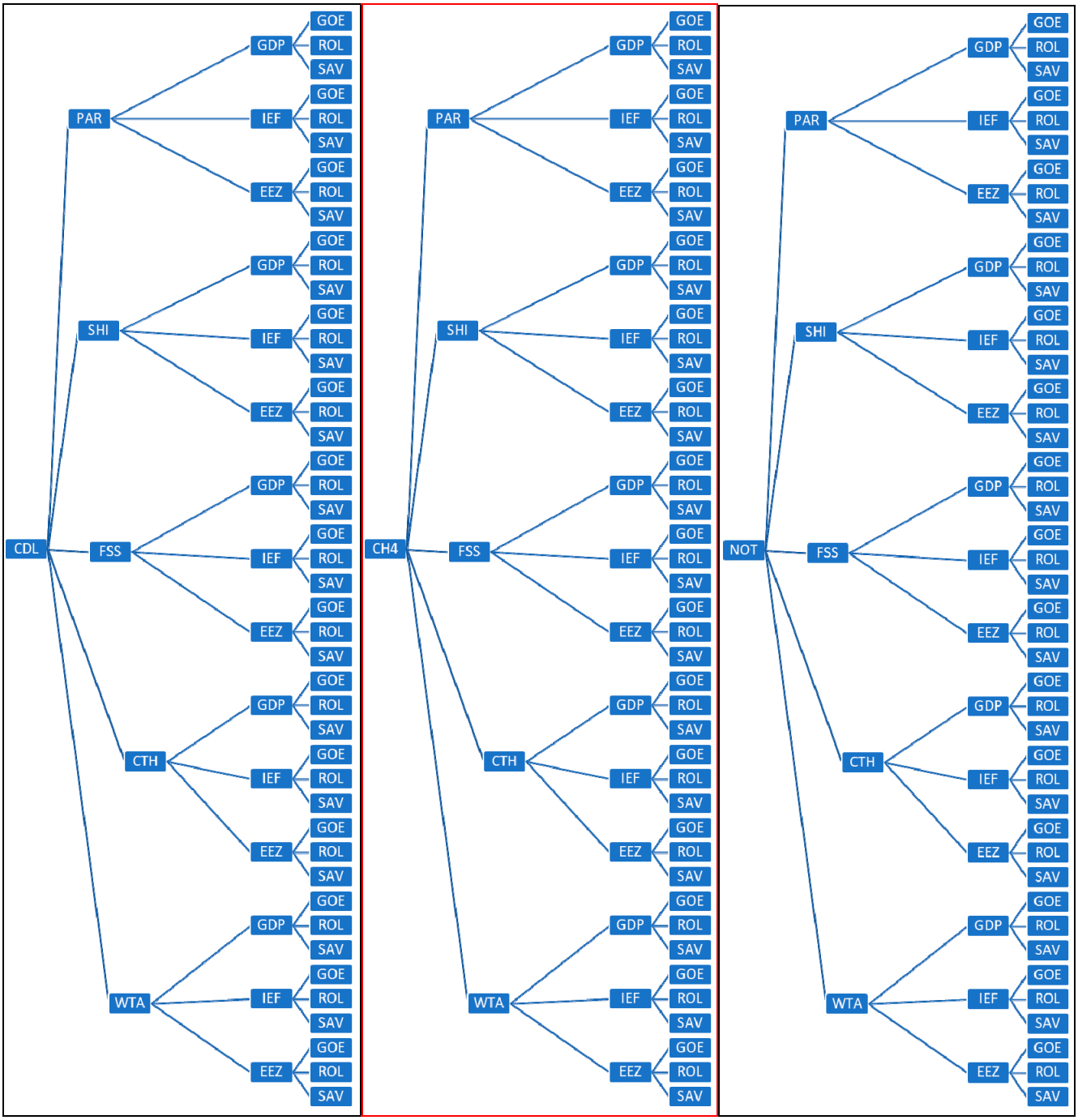


Figure S2: Possible combinations of indicators selected following Method 2 (see subsection 'Selection of indicators to represent each of the 5 variables' in Method section). Each acronym represents an indicator of a given variable and the meaning of each acronym as well as the corresponding variable are in Table S1.