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Impacts of international trade on global sustainable development

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Supplementary Information for:

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22 Supplementary Tables

23 Supplementary Table 1. Code and GDP per capita for each country or region

Country Name	Abbr.	GDPPC ¹	HDI ²	Income group	Country group
Australia	AUS	36,412	0.94	High income	Developed country
Austria	AUT	39,375	0.89	High income	Developed country
Belgium	BEL	37,126	0.90	High income	Developed country
Bulgaria	BGR	10,949	0.79	Upper middle income	Developing country
Brazil	BRA	11,992	0.75	Upper middle income	Developing country
Canada	CAN	35,306	0.92	High income	Developed country
China	CHN	4,847	0.74	Upper middle income	Developing country
Cyprus	CYP	30,602	0.86	High income	Developed country
Czech Republic	CZE	23,441	0.88	High income	Developed country
Germany	DEU	36,934	0.93	High income	Developed country
Denmark	DNK	42,367	0.93	High income	Developed country
Spain	ESP	30,437	0.88	High income	Developed country
Estonia	EST	18,667	0.87	High income	Developed country
Finland	FIN	35,771	0.90	High income	Developed country
France	FRA	34,742	0.90	High income	Developed country
United Kingdom	GBR	34,412	0.91	High income	Developed country
Greece	GRC	26,859	0.87	High income	Developed country
Hungary	HUN	19,576	0.84	High income	Developed country
Indonesia	IDN	6,554	0.69	Lower middle income	Developing country
India	IND	3,041	0.62	Lower middle income	Developing country
Ireland	IRL	41,180	0.92	High income	Developed country
Italy	ITA	36,452	0.89	High income	Developed country
Japan	JPN	34,384	0.90	High income	Developed country
Korea, Rep.	KOR	22,683	0.90	High income	Developed country

Lithuania	LTU	15,392	0.85	High income	Developing country
Luxembourg	LUX	82,080	0.90	High income	Developed country
Latvia	LVA	14,206	0.83	High income	Developing country
Mexico	MEX	15,638	0.76	Upper middle income	Developing country
Malta	MLT	24,599	0.86	High income	Developed country
Netherlands	NLD	42,001	0.92	High income	Developed country
Poland	POL	15,795	0.86	High income	Developing country
Portugal	PRT	25,591	0.84	High income	Developed country
Romania	ROU	13,050	0.80	Upper middle income	Developing country
Russian Federation	RUS	16,894	0.80	Upper middle income	Developing country
Slovak Republic	SVK	18,260	0.85	High income	Developed country
Slovenia	SVN	24,405	0.89	High income	Developed country
Sweden	SWE	37,826	0.91	High income	Developed country
Turkey	TUR	14,775	0.77	Upper middle income	Developing country
Taiwan, China	TWN	15,041	unknown	High income	Developed region
United States	USA	46,026	0.92	High income	Developed country
Rest of World	ROW	2,243	unknown	Low income	Developing country ³

¹ GDP per capita, PPP (constant 2011 international \$), here we took the mean value of GDPPC from 1995 to 2009.

² Human Development Index (HDI) [1](#) in 2015.

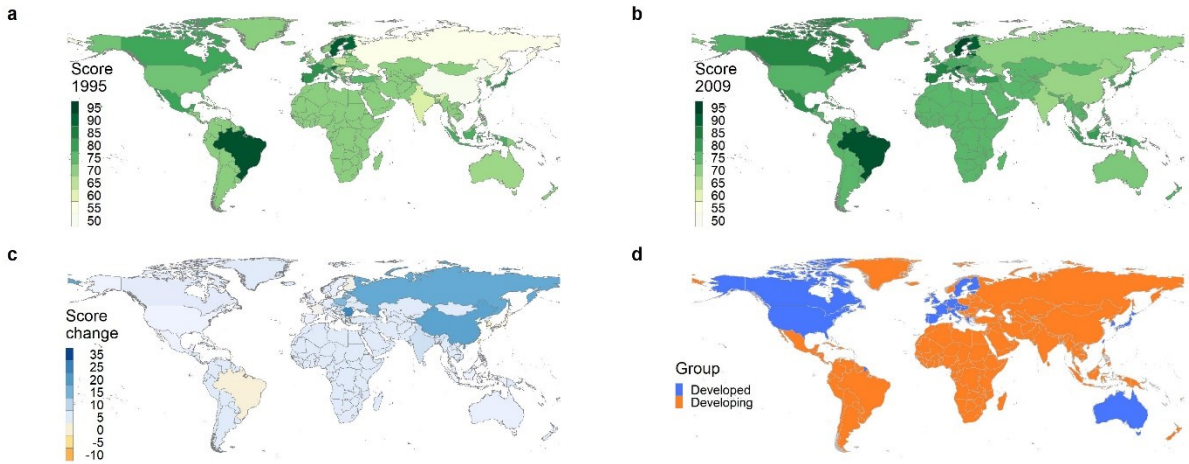
³ ROW (Rest of the World) is a country group named by WIOD. This group include all the other countries (including several developed countries) not listed in this table. We classified and treated ROW as a developing region based on the average GDPPC and HDI for the sake of simplification.

30 **Supplementary Table 2. Adjacent countries and distant countries.** (The number 1 indicates adjacent countries pair, 0 represents
31 distant countries pair, and * stands for country itself) (see Supplementary Table 1 for country names of the abbreviations).

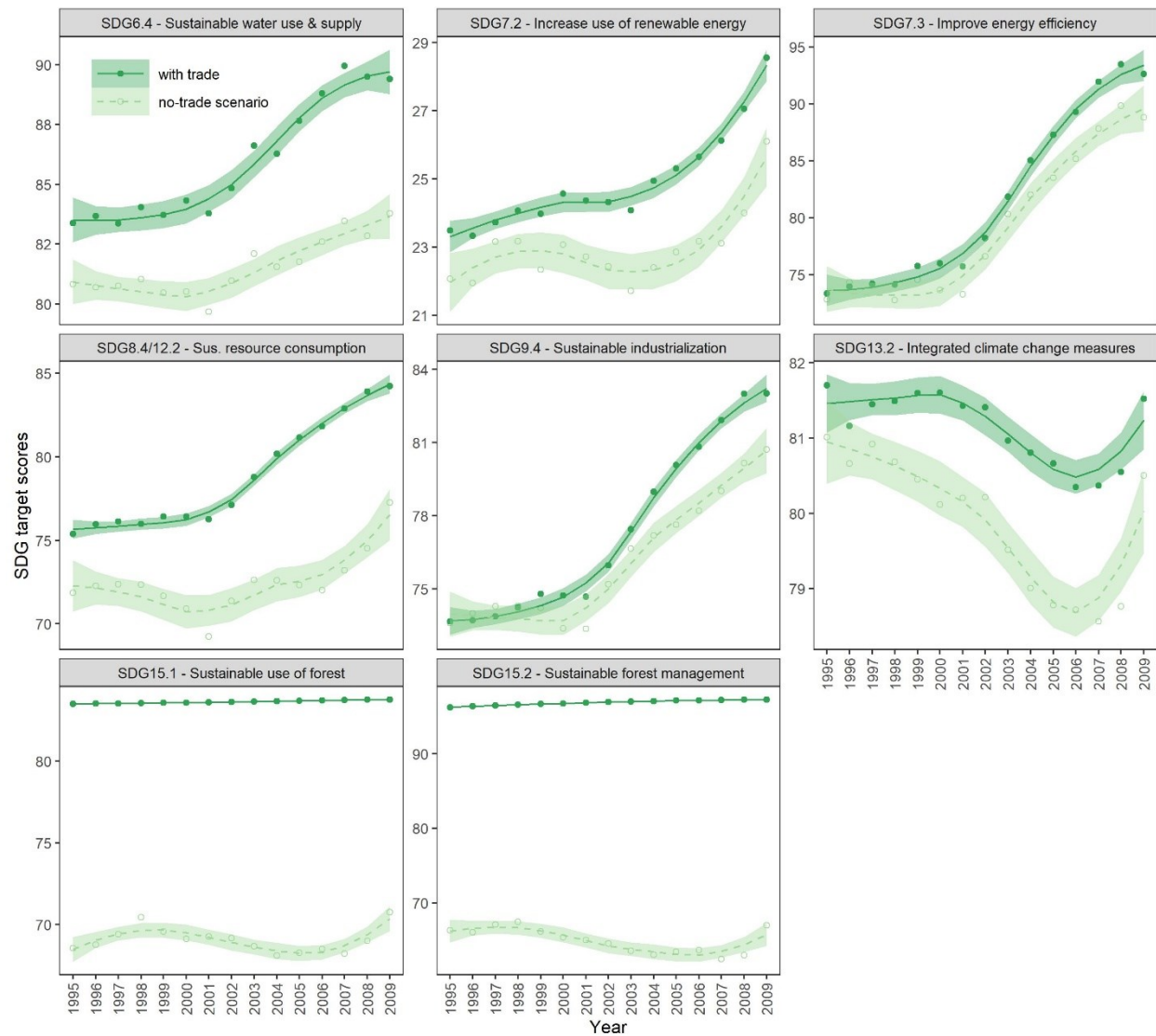
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AUS	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
AUT	0	*	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
BEL	0	0	*	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
BGR	0	0	0	*	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	
BRA	0	0	0	0	*	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
CAN	0	0	0	0	0	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
CHN	0	0	0	0	0	0	*	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	
CYP	0	0	0	0	0	0	0	*	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
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ESP	0	0	0	0	0	0	0	0	0	0	0	*	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
EST	0	0	0	0	0	0	0	0	0	0	0	0	*	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	
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RUS	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	1	0	1	*	0	0	1	1	0	1	1	1	
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SVN	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	*	0	0	0	0	0	1	
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USA	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	*	1	
ROW	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	*

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33 Notes: Countries that share land or maritime borders were deemed as *adjacent countries*. In all other cases, two countries or regions
34 were deemed as *distant countries for trade* ^{2,3}.

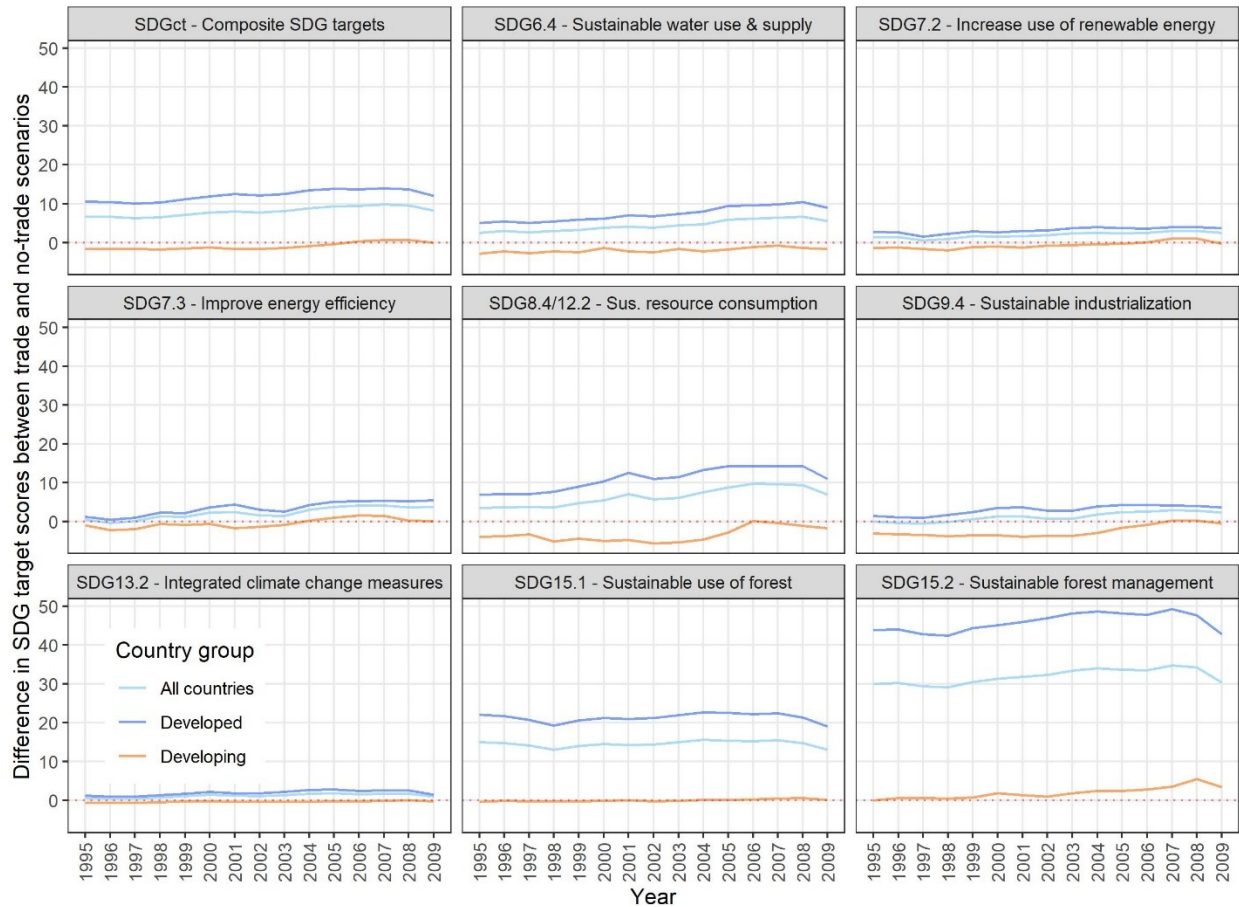
Supplementary Figures



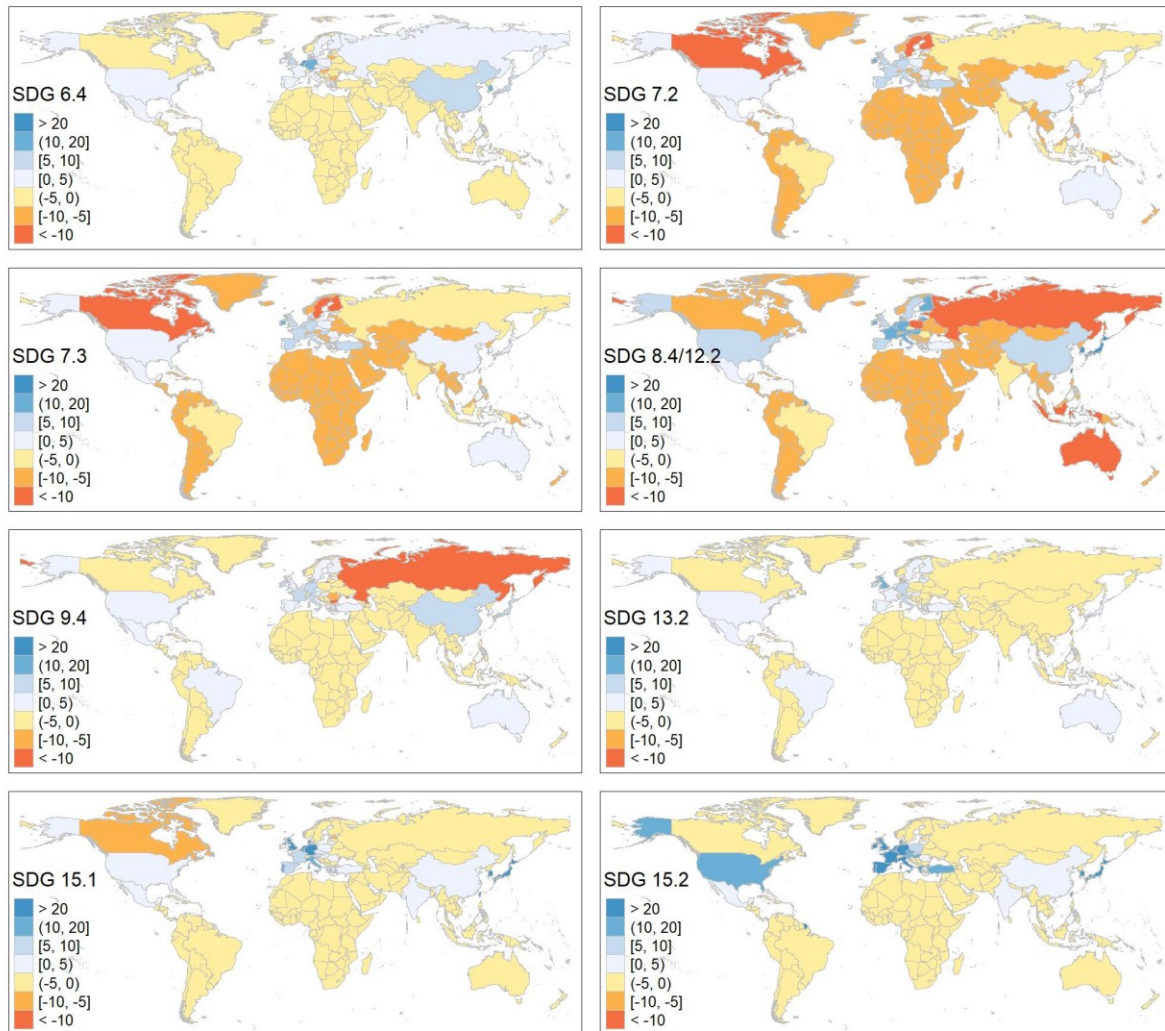
Supplementary Figure 1. Maps of composite SDG target (SDGct) scores and their changes over time. (a) SDGct score in 1995; (b) SDGct score in 2009; (c) change in SDGct scores between 1995 and 2009; (d) Developed countries (blue color) and developing countries (orange color) (see country list in Supplementary Table 1).



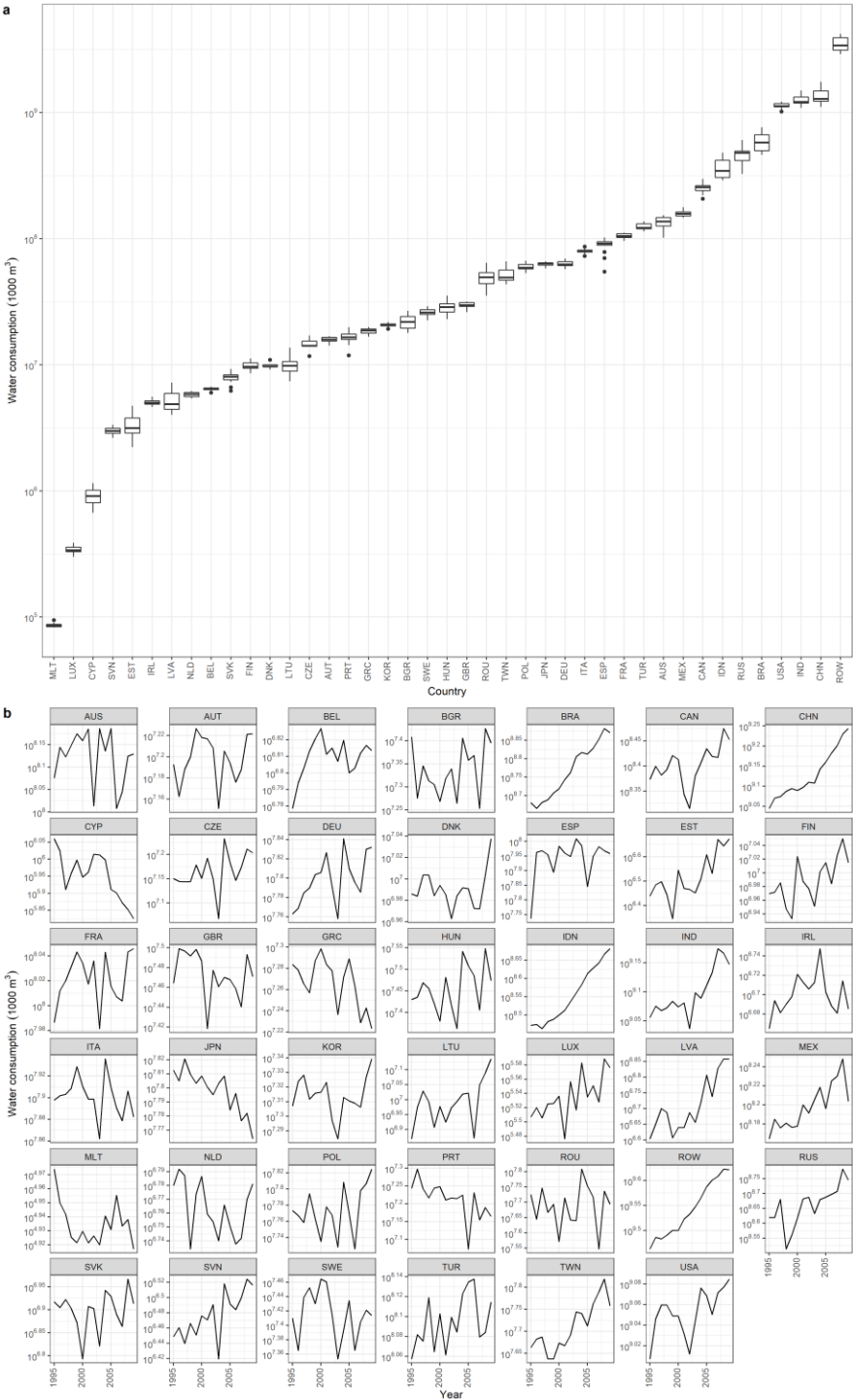
Supplementary Figure 2. Temporal changes in SDG target scores at the global level under trade and no-trade scenarios from 1995 to 2009.

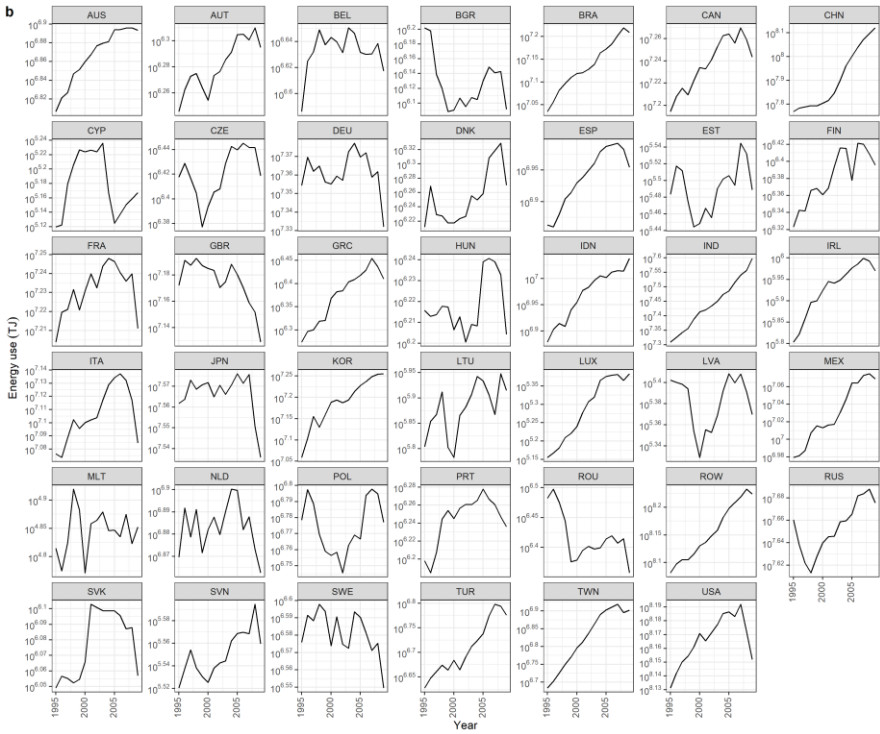
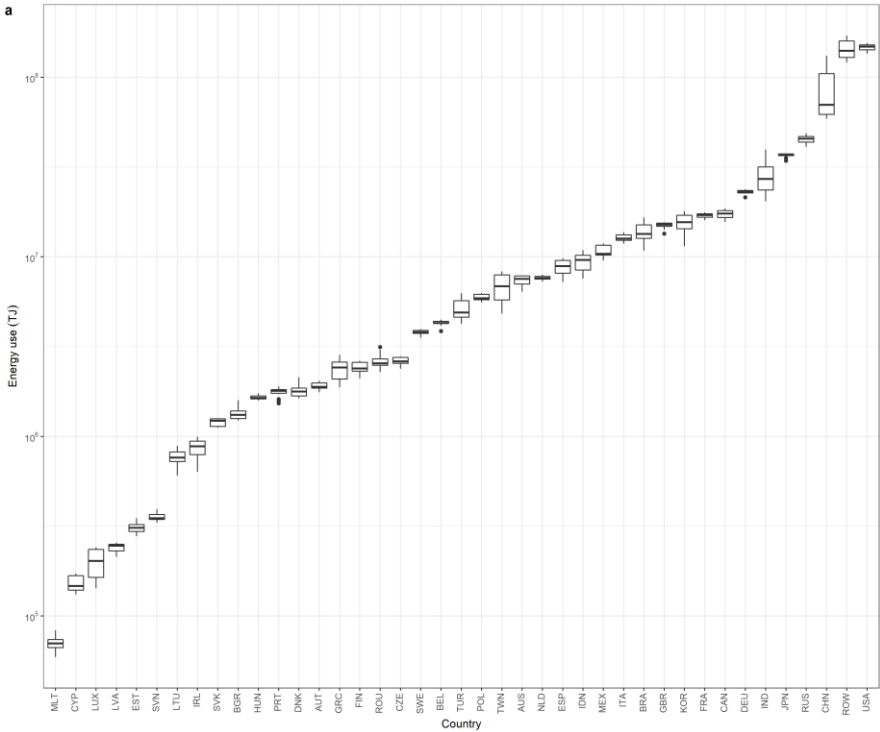


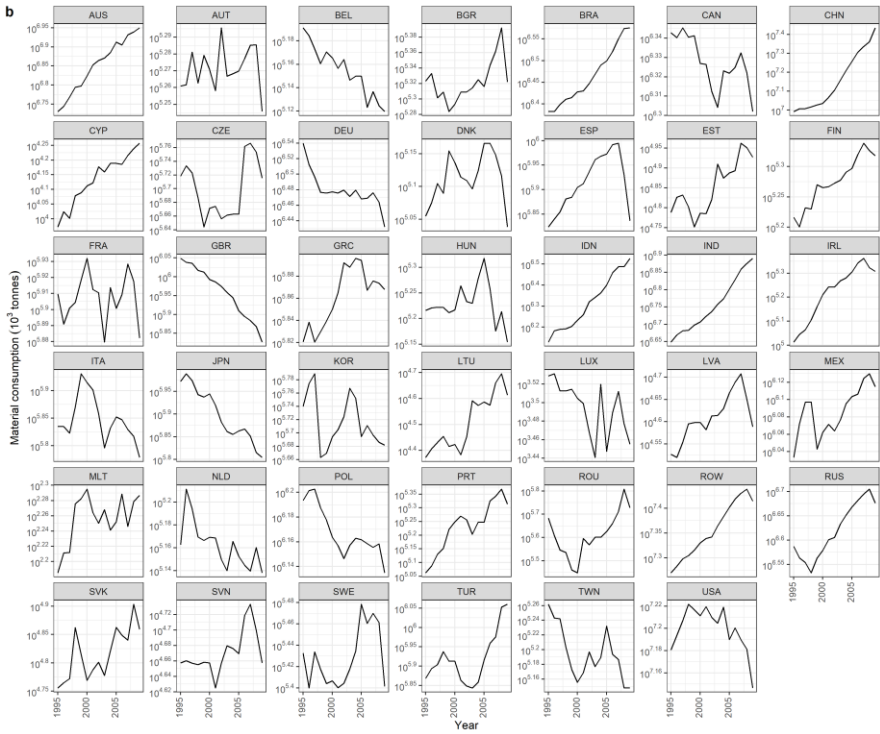
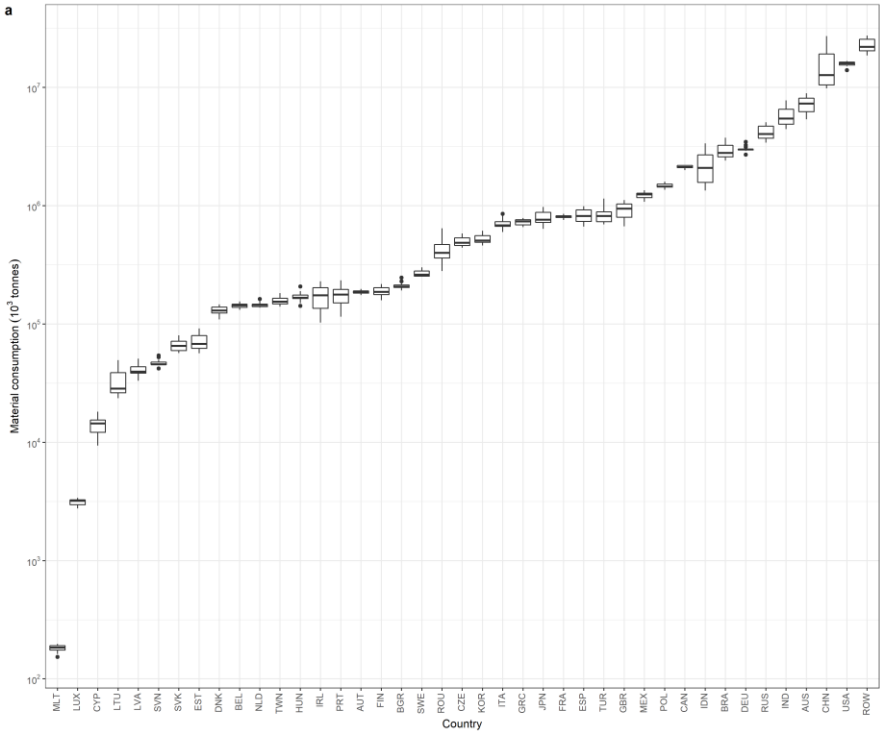
Supplementary Figure 3. Difference in SDG target scores between trade and no-trade scenarios for each SDG target over time from 1995 to 2009 (Composite SDG target is abbreviated as SDGct in Figures). Differences above 0 indicate that trade improved SDG target scores, while differences below 0 indicate trade decreased SDG target scores. Although the impacts of trade on SDG target scores varied across years, it is clear that developed countries scored higher while developing countries scored lower under a trade scenario when compared with a no-trade scenario.

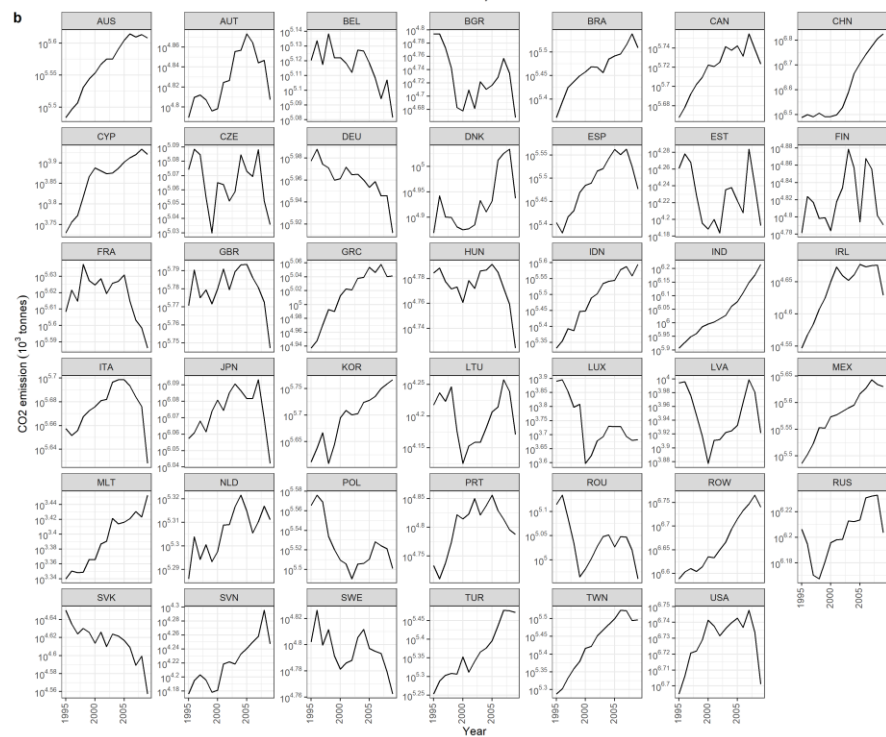
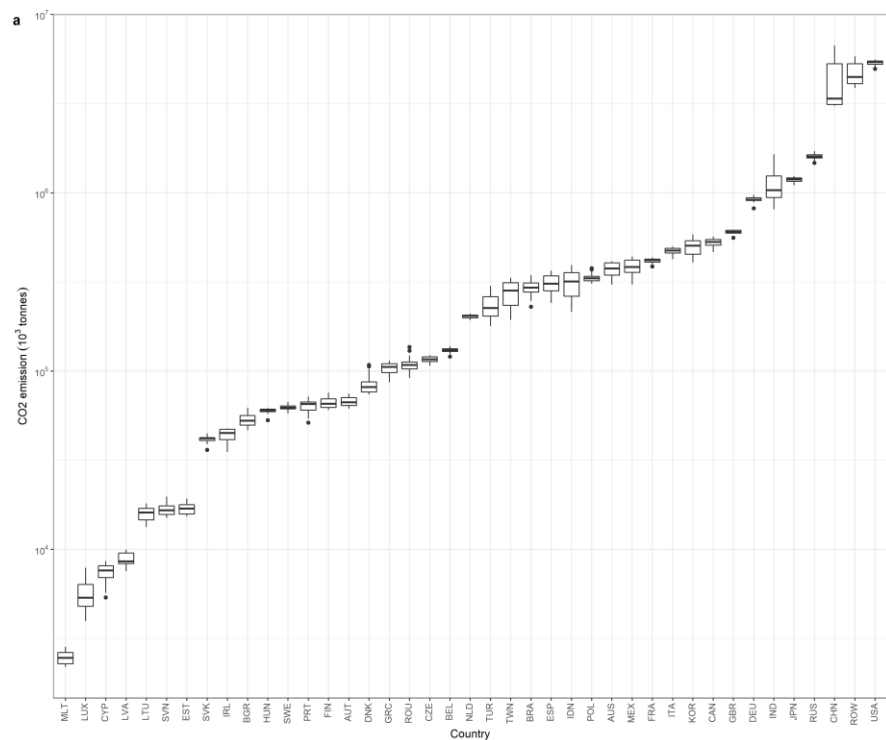


Supplementary Figure 4. Spatial pattern of difference in each SDG target score between trade and no-trade scenarios (calculated from the average difference of SDG target scores between trade and no-trade scenarios during 1995-2009).

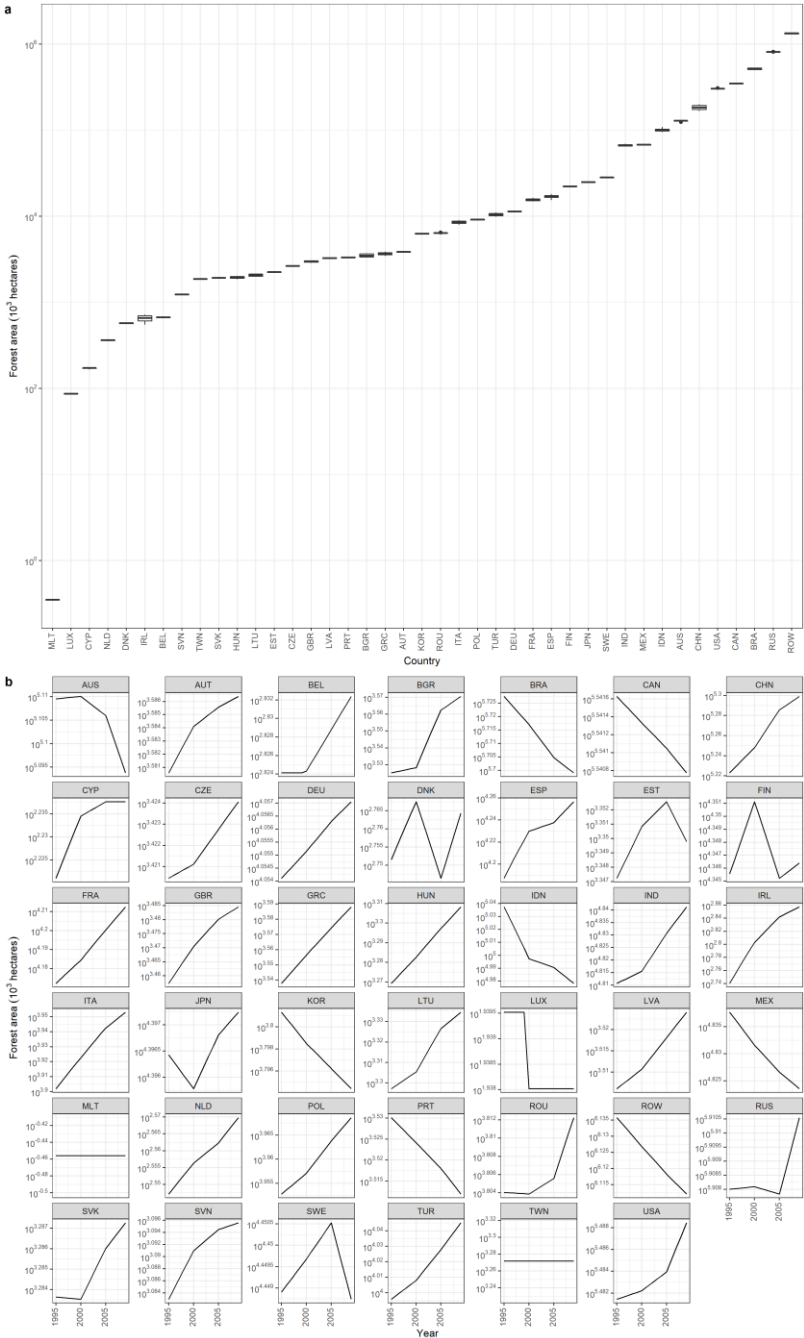




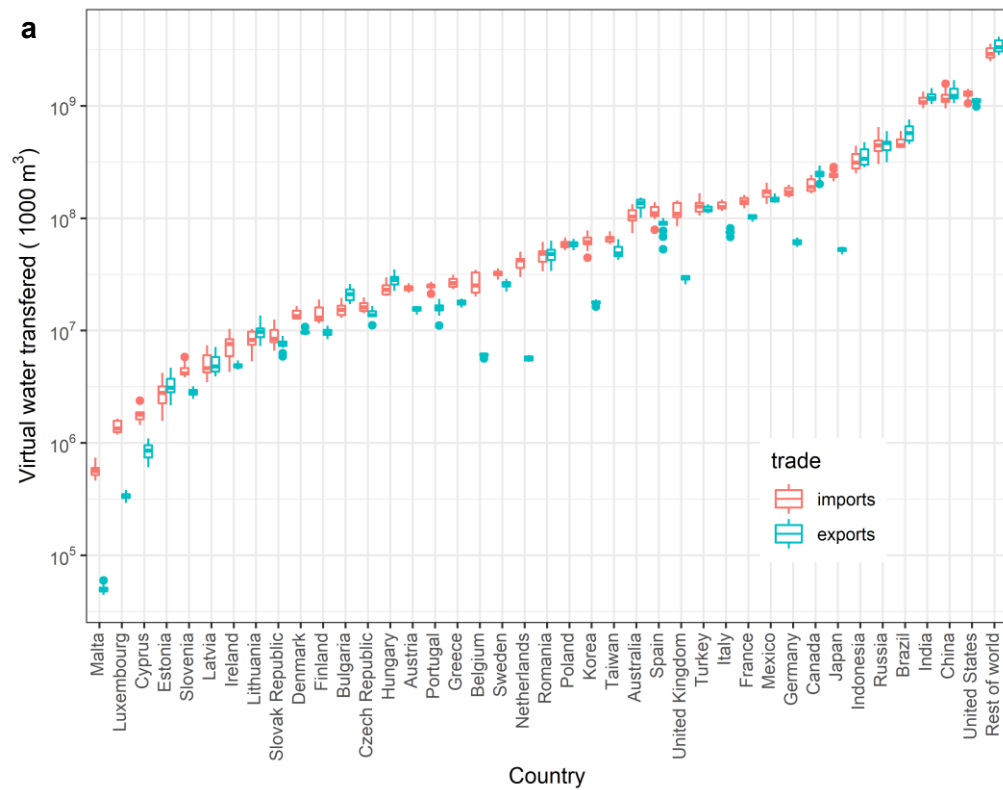




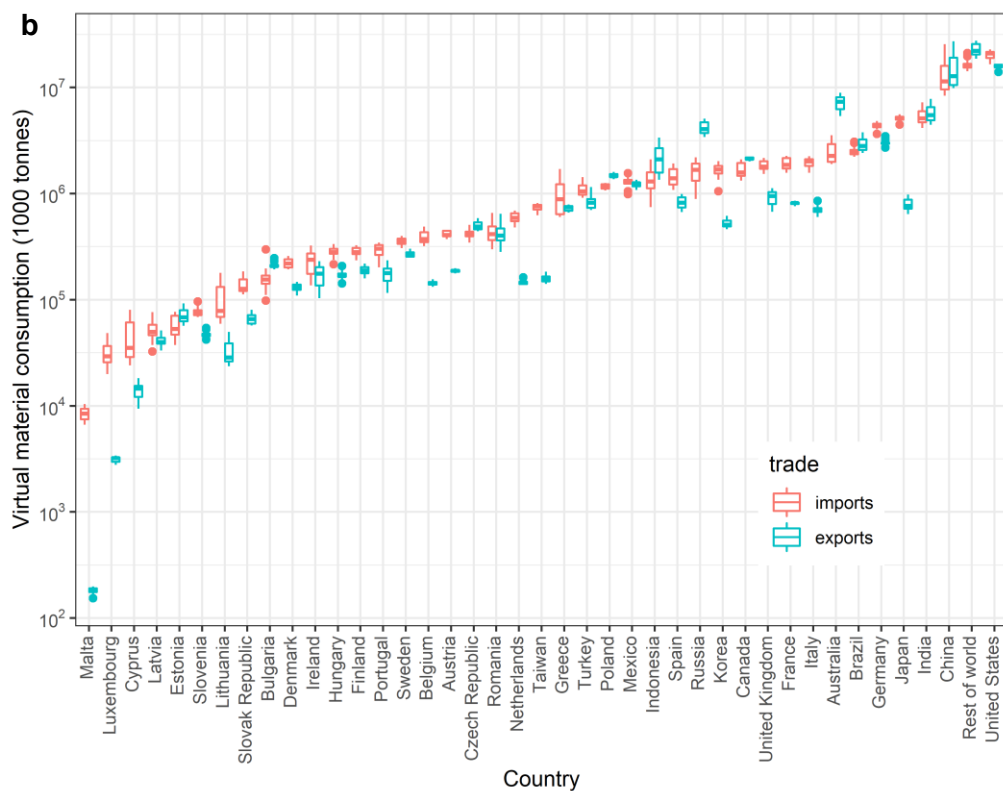
75 (E) Forest area



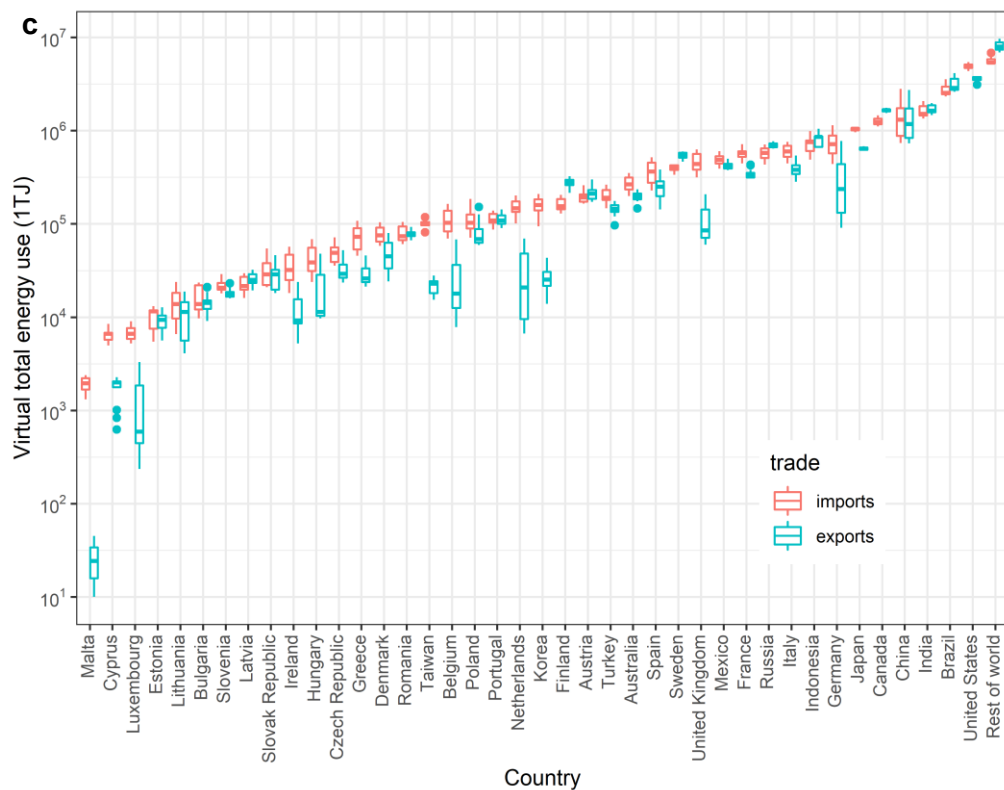
76
77 **Supplementary Figure 5. Overview of the environmental data in World Input-Output**
78 **Database. (A) Water consumption; (B) Energy use; (C) Material consumption; (D) CO₂**
79 **emissions; (E) Forest area. (a – average consumption/emissions by country; b -**
80 **consumption/emissions by year by country).**



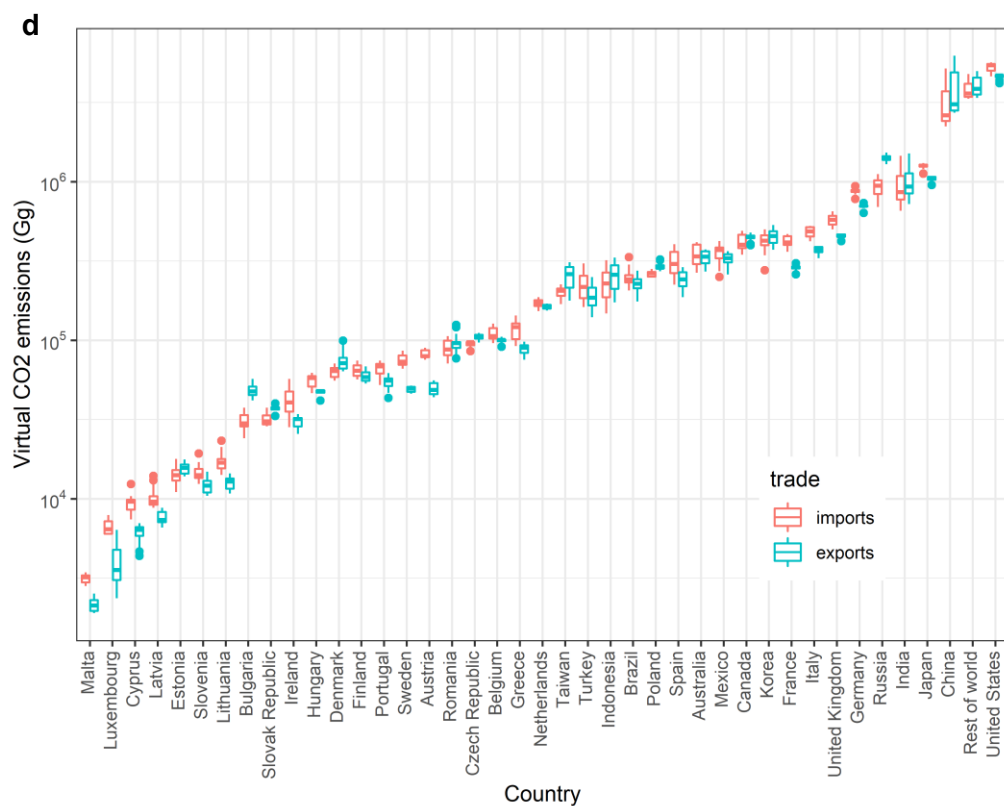
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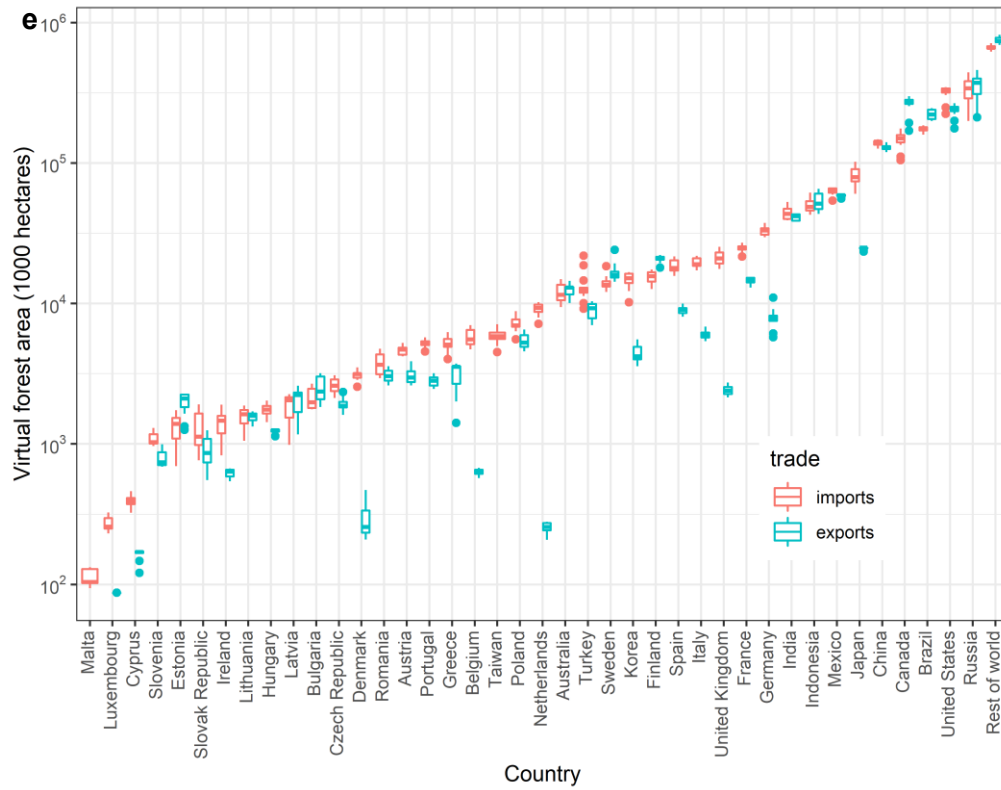
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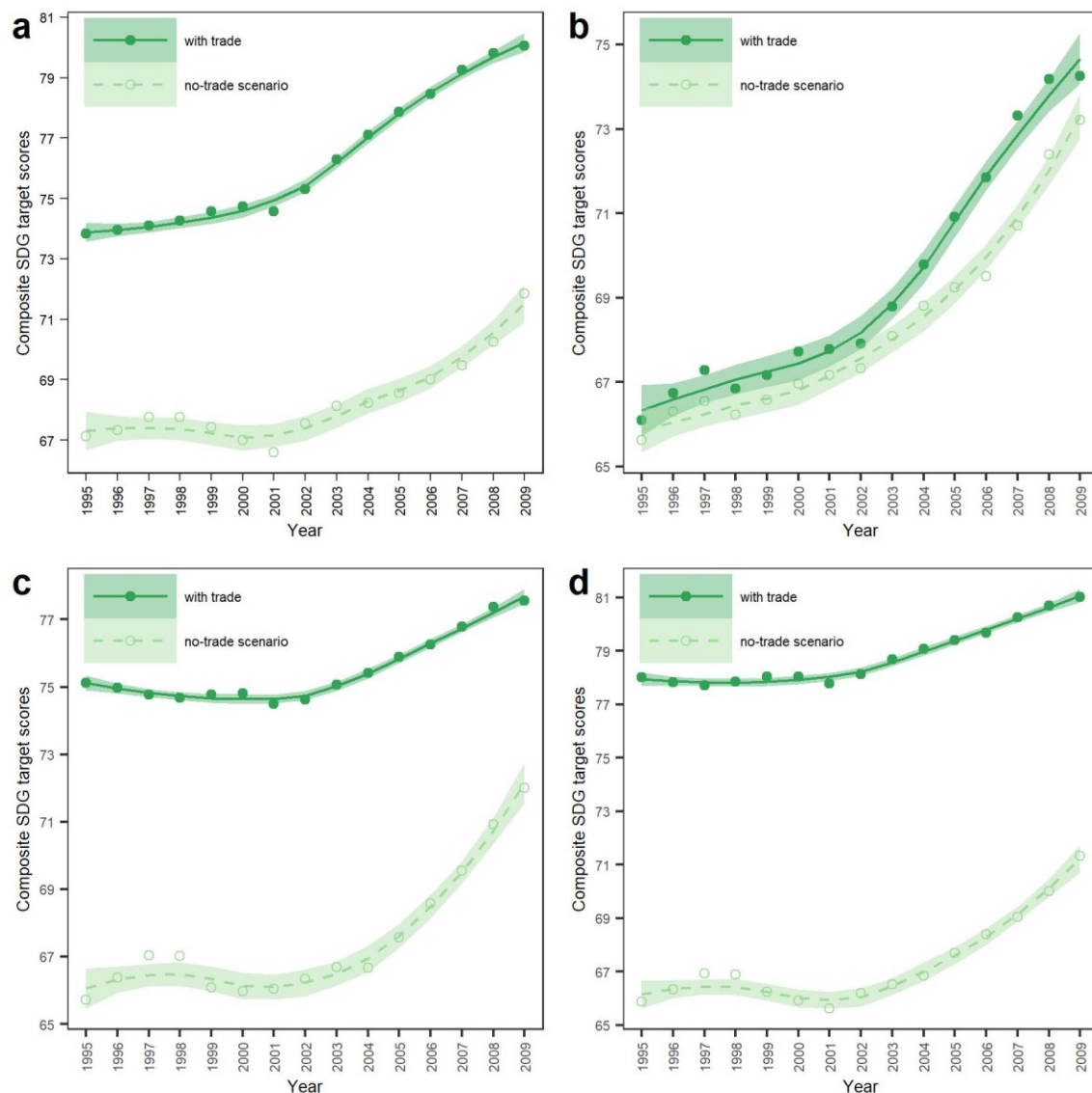
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84



Supplementary Figure 6. Statistical description of virtual (a) water, (b) energy, (c) material, (d) CO₂ emissions, and (e) forest area embodied in trade.



Supplementary Figure 7. Composite SDG target score at the global level weighted by (a) equal weight for all countries, (b) population, (c) GDP, and (d) GDP per capita.

Supplementary References

- 1 UNDP. Human Development Data. <http://hdr.undp.org/en/data> (2017).
- 2 Anderson, E. W. *International Boundaries: A Geopolitical Atlas*. (Routledge, 2003).
- 3 Jonathan I. Charney, D. A. C., Lewis M. Alexander, Robert W. Smith. *International maritime boundaries*. Vol. 5 (Martinus Nijhoff Publishers, 2005).