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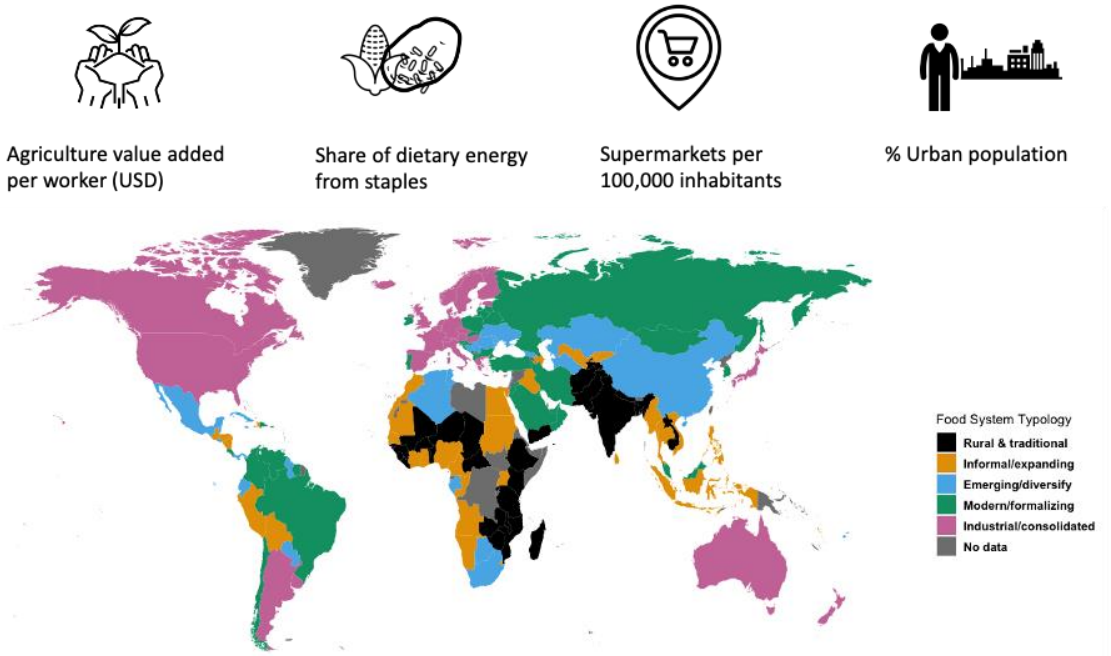
Supplementary information

Global food systems transitions have enabled affordable diets but had less favourable outcomes for nutrition, environmental health, inclusion and equity

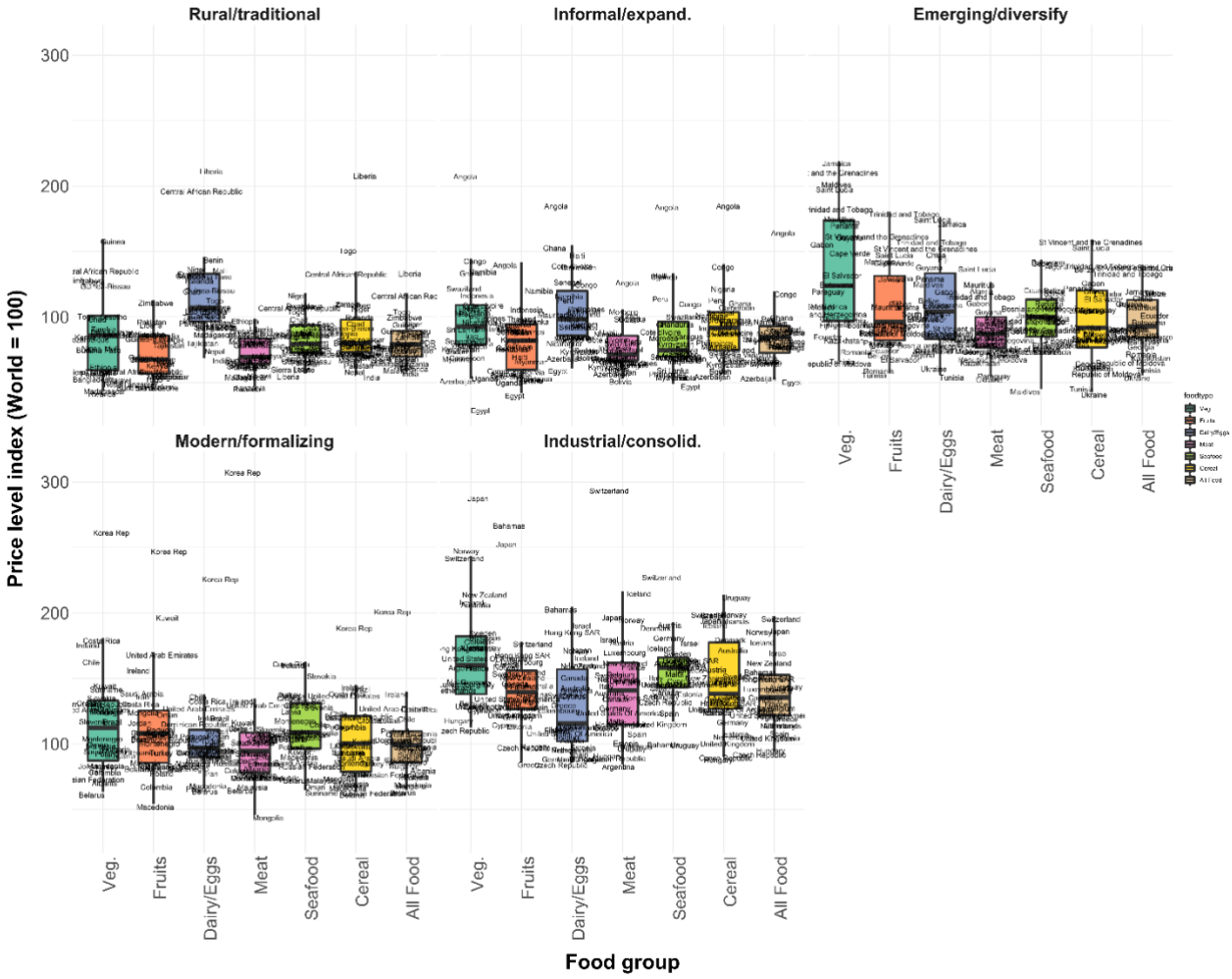
In the format provided by the authors and unedited

Supplementary Material

Supplementary Figure 1: Map of country-level food system typology based on four indicators: agriculture value added per worker, the share of dietary energy from staples, supermarket density, and urban population (Marshall et al., 2021)

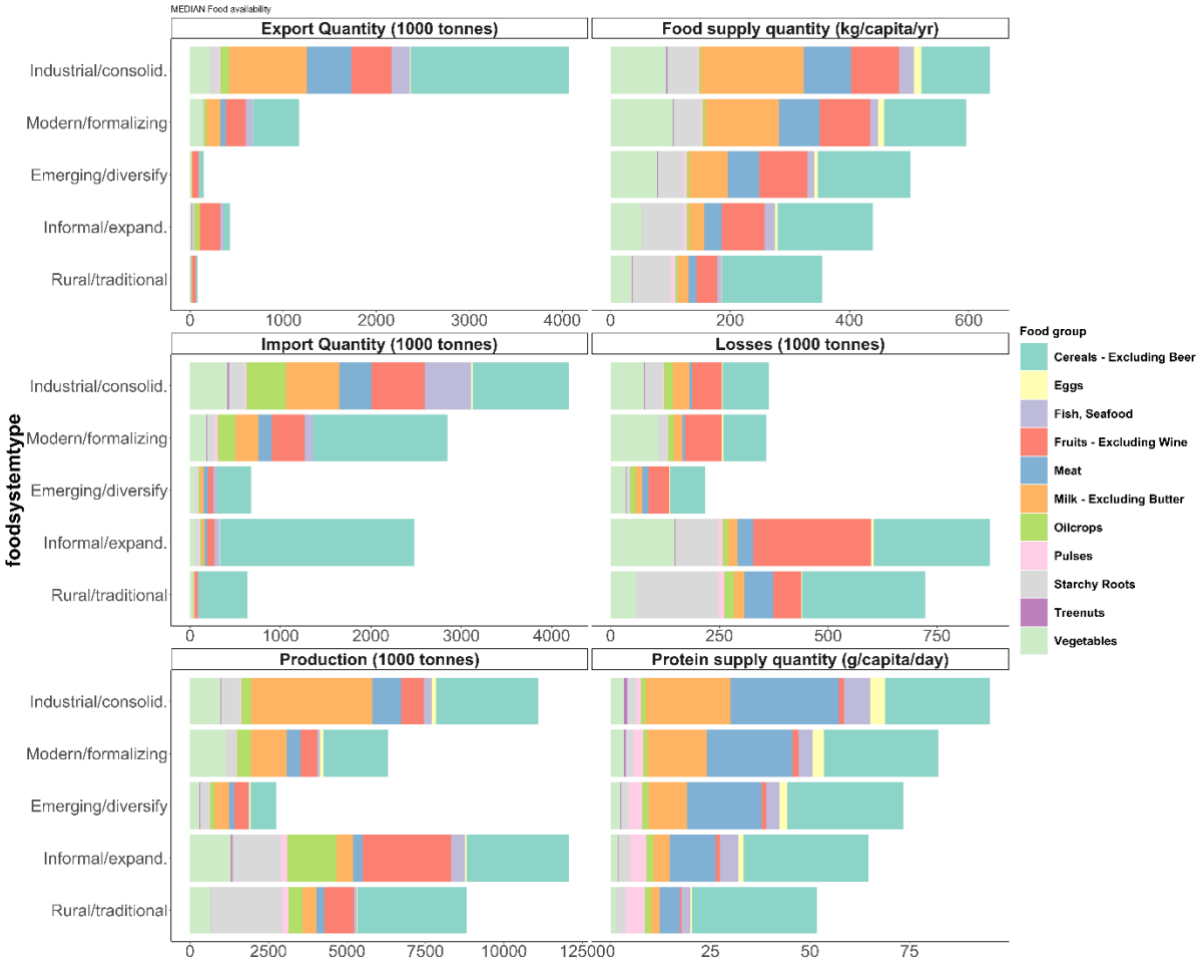


Supplementary Figure 2: Price Level Index over all Food Groups by Food System Typology



Sources: [11,140]

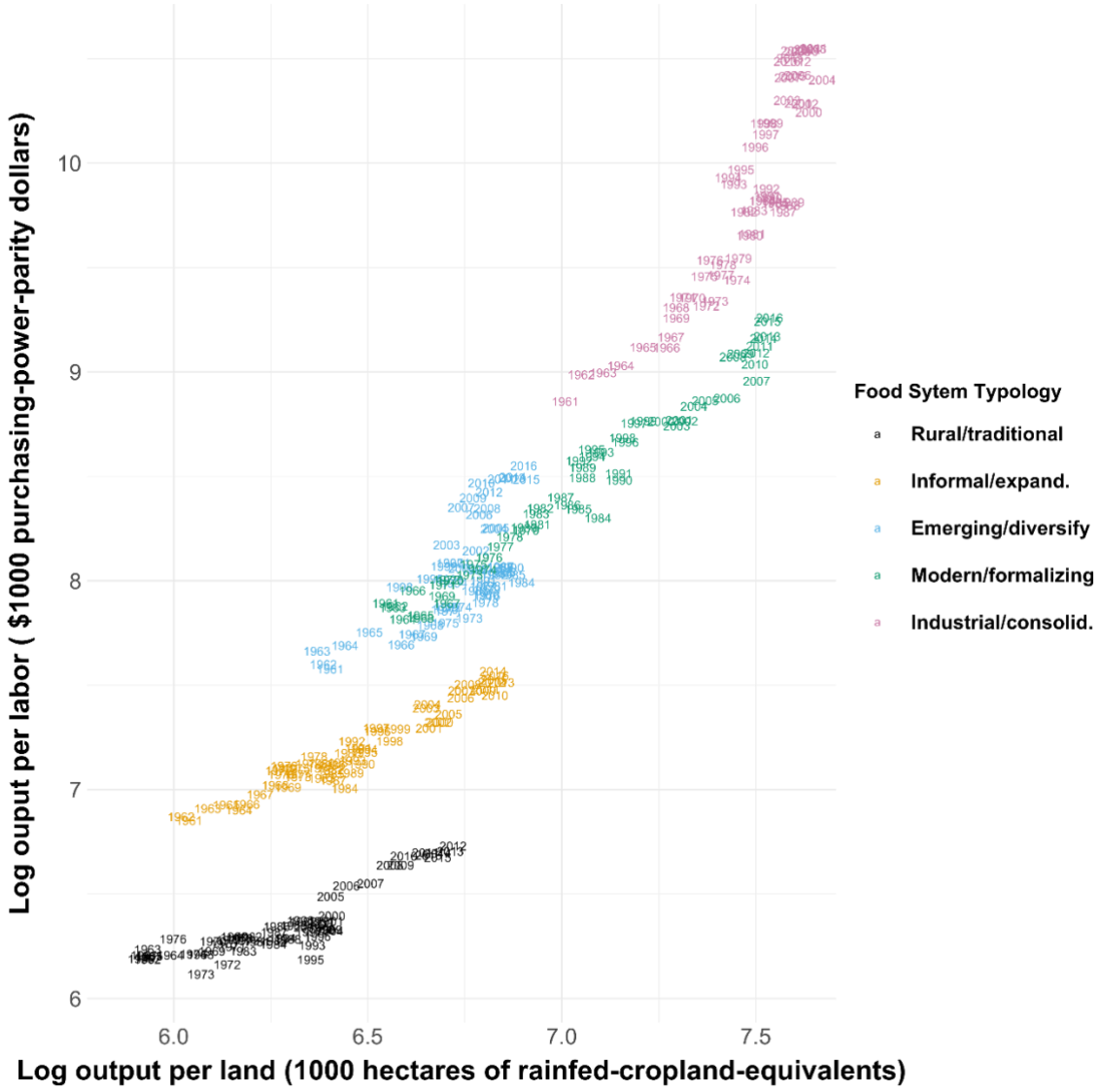
Supplementary Figure 3. Median food and protein supply, loss, imports, and exports by food system typology



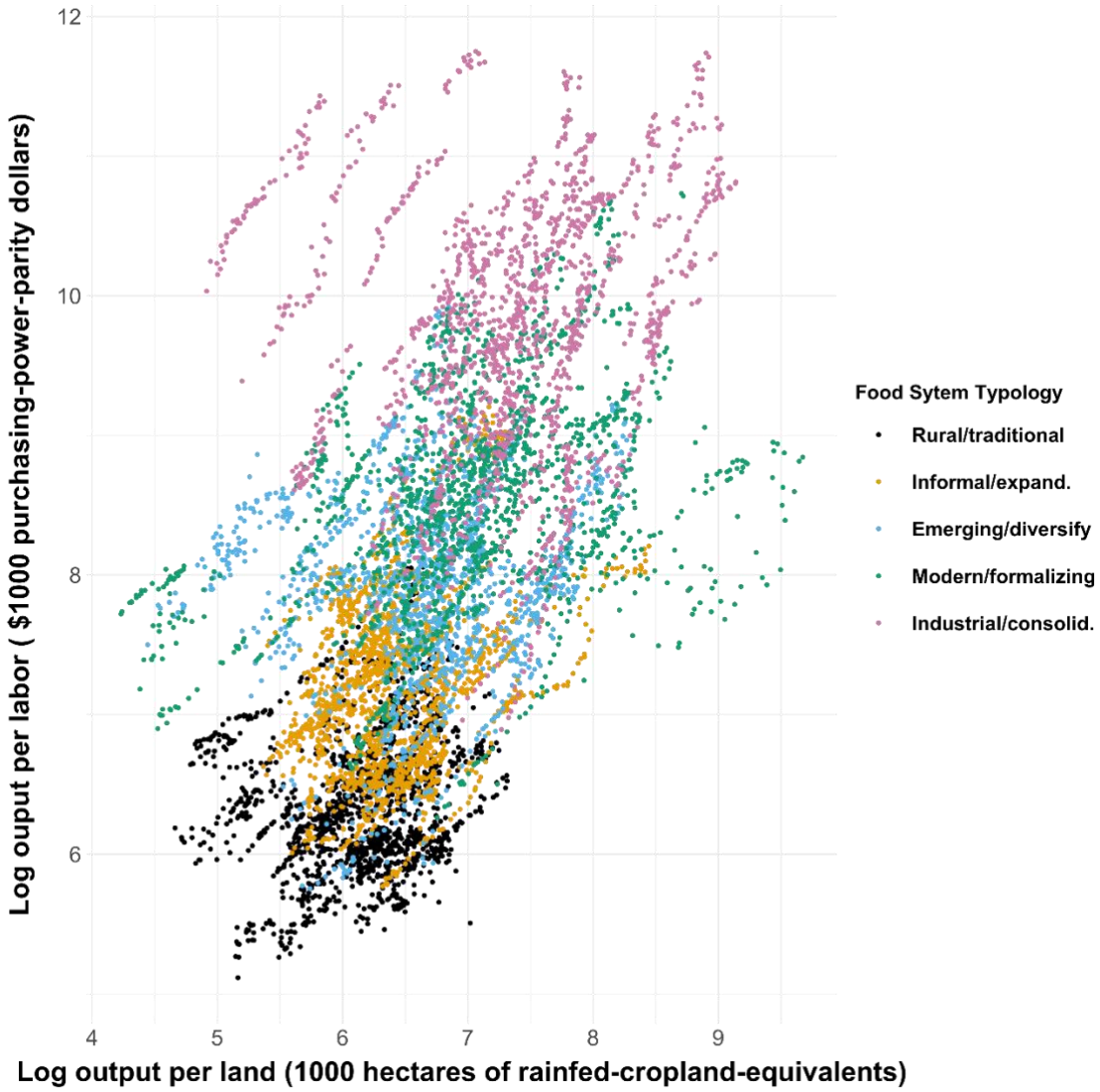
Source: [79]

Supplementary Figure 4. Change in land and labor productivity over time, by food system typology (1961-2016)

Panel A: Annual median land and labor productivity over time, by food system typology

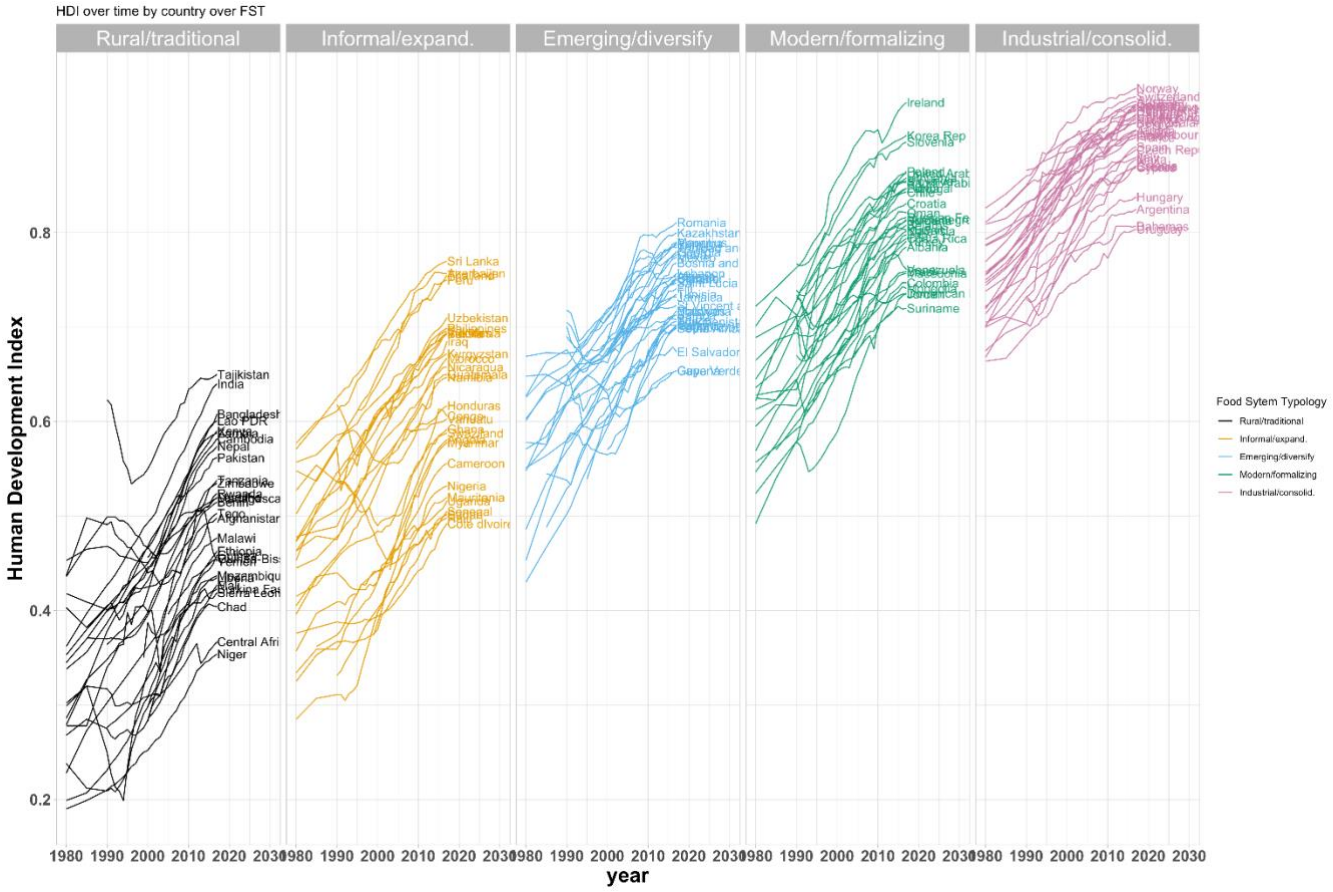


Panel B: Annual domestic land and labor productivity over time, at country level by food system typology



Source: [141]

Supplementary Figure 5. Human development over time by food system typology (1980-2018)

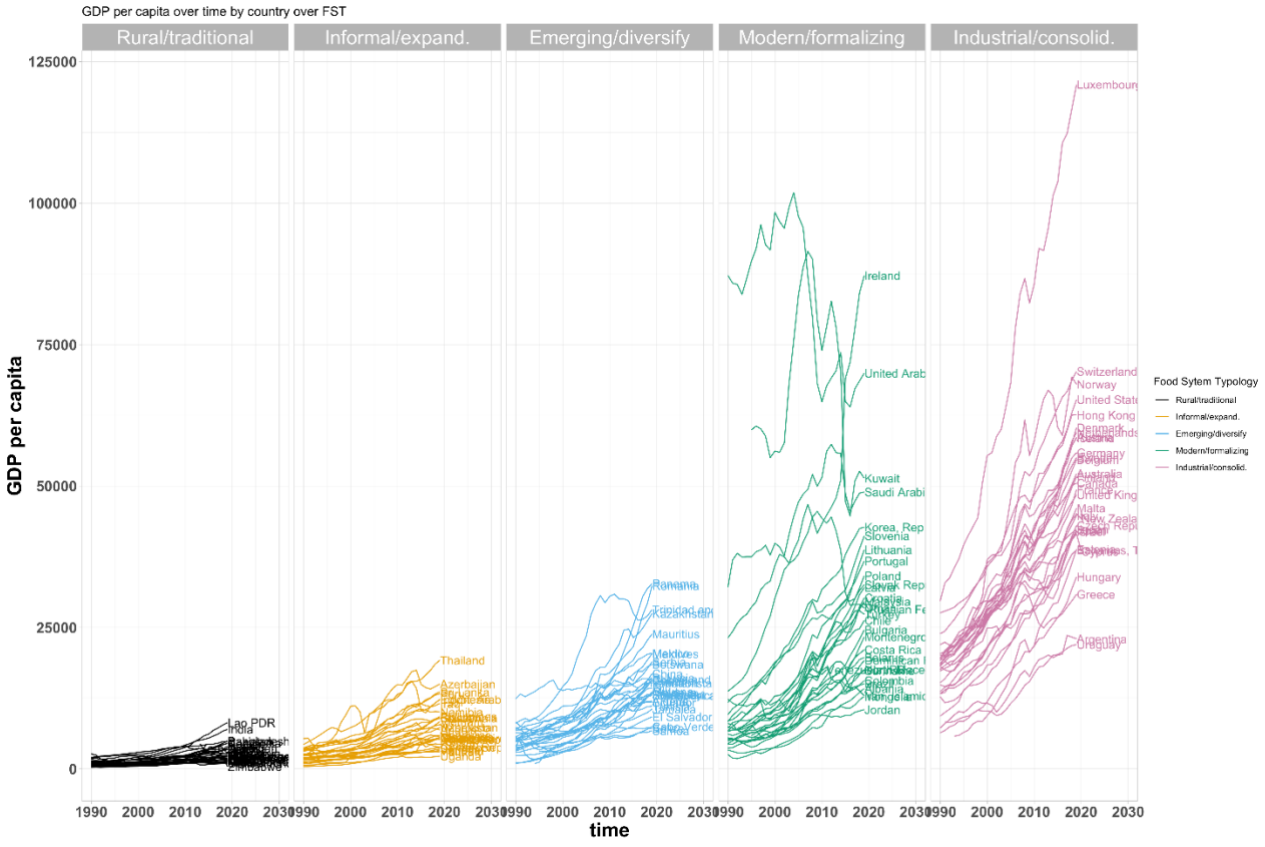


Source: [17]

Supplementary Figure 6. Gini over time by food system typology (1980-2019)

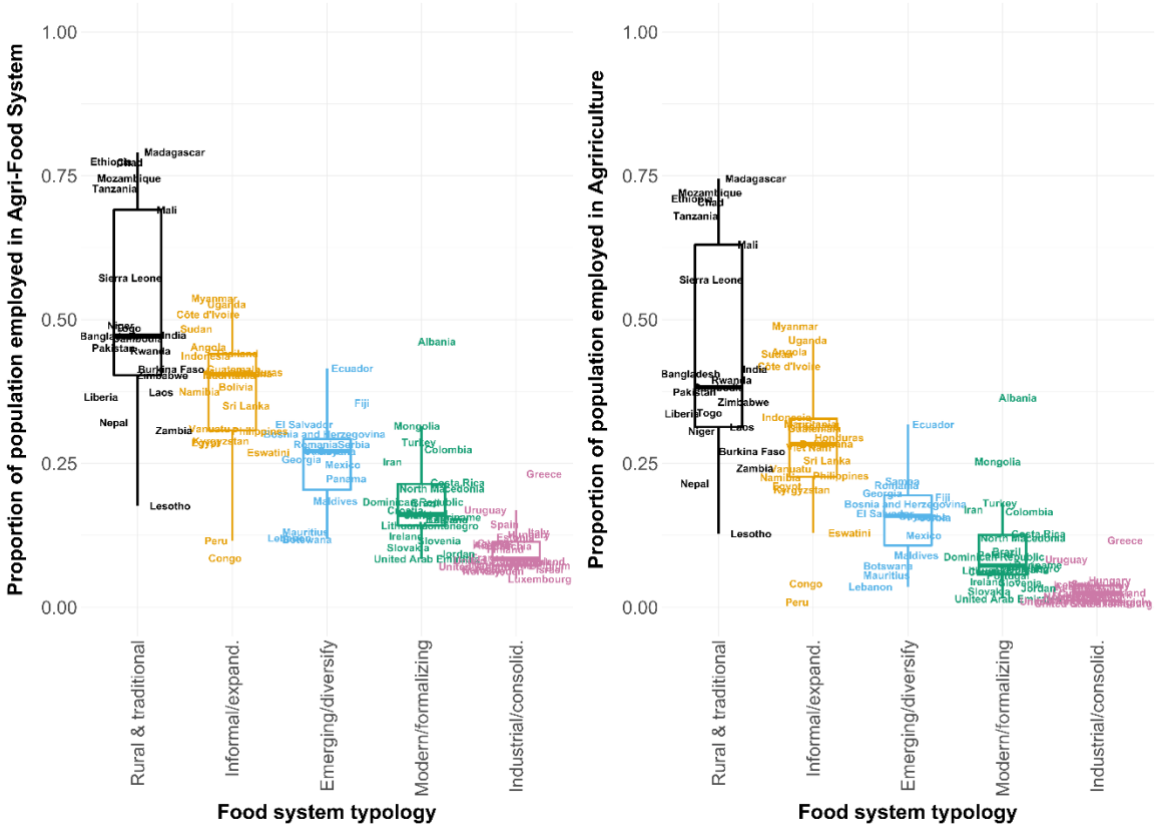
Source: [17]

Supplementary Figure 7. GDP per capita in PPP dollars over time (1990–2020) by food system typology



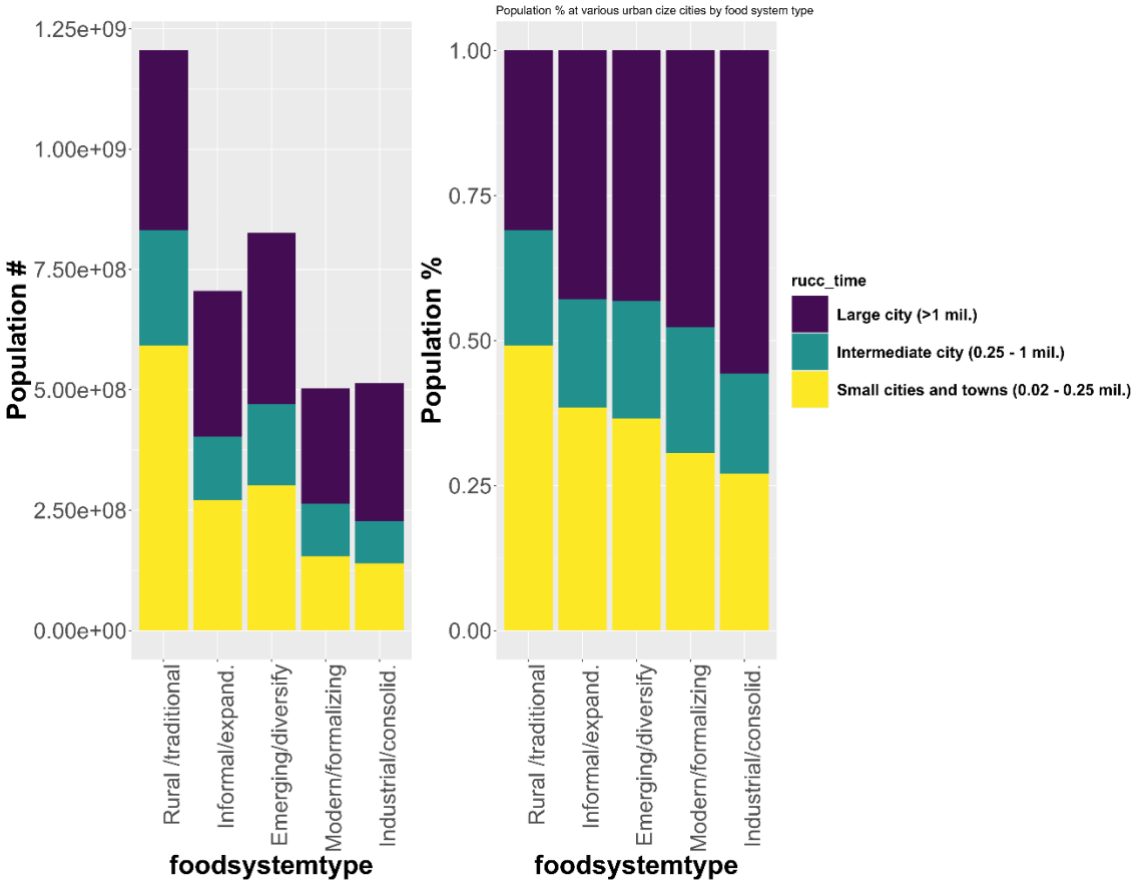
Source: [17]

Supplementary Figure 8. Share of the workforce employed in agri-food systems (Panel A) and agriculture (Panel B) by food system typology



Supplementary Figure 9: Population in Urban catchment areas by food system typology (2015). Panel A represents the actual population numbers in urban catchment areas and Panel B represents the proportion of populations in urban catchment areas.

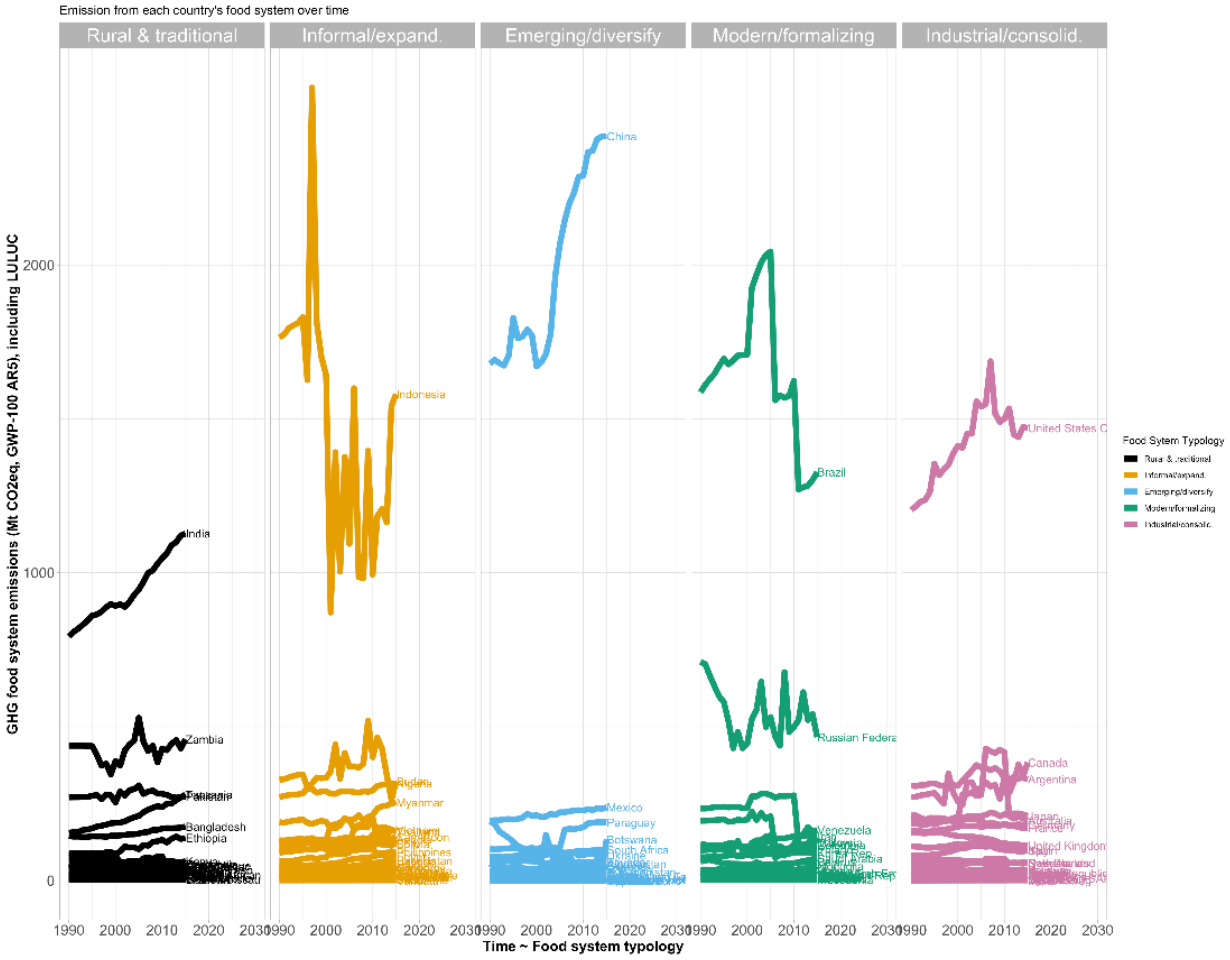
Panel A **Panel B**



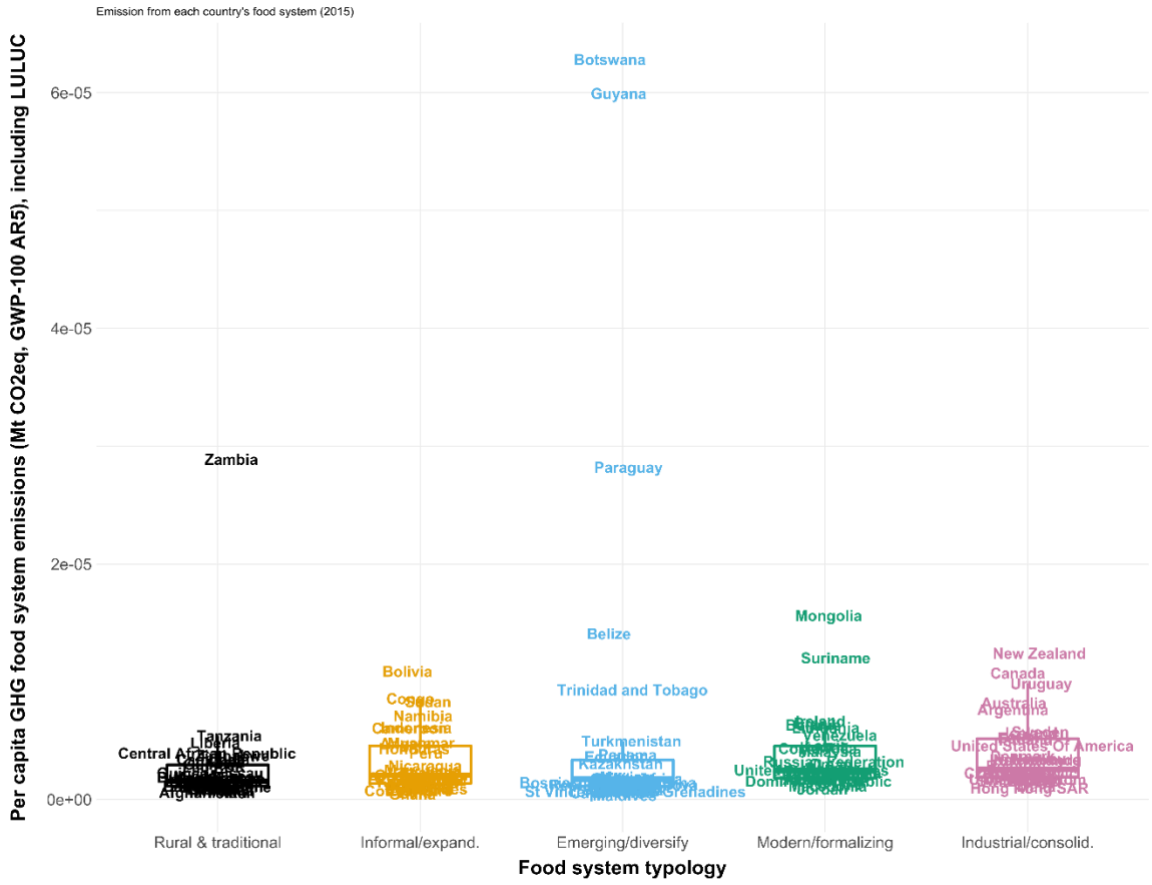
Source: [17]

Supplementary Figure 10. Food System Emissions by typology

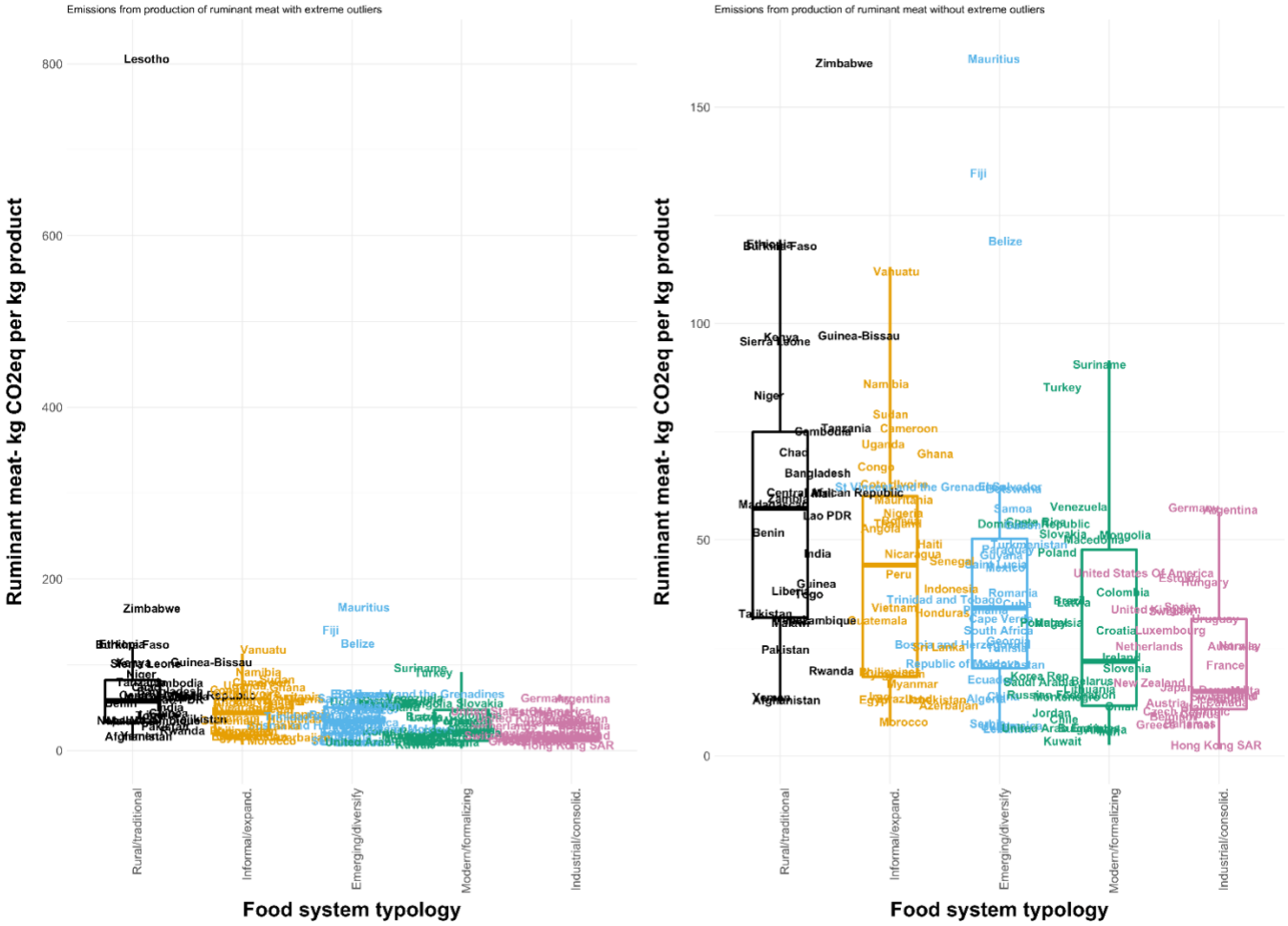
Panel A: Total food system emissions (1990-2015)



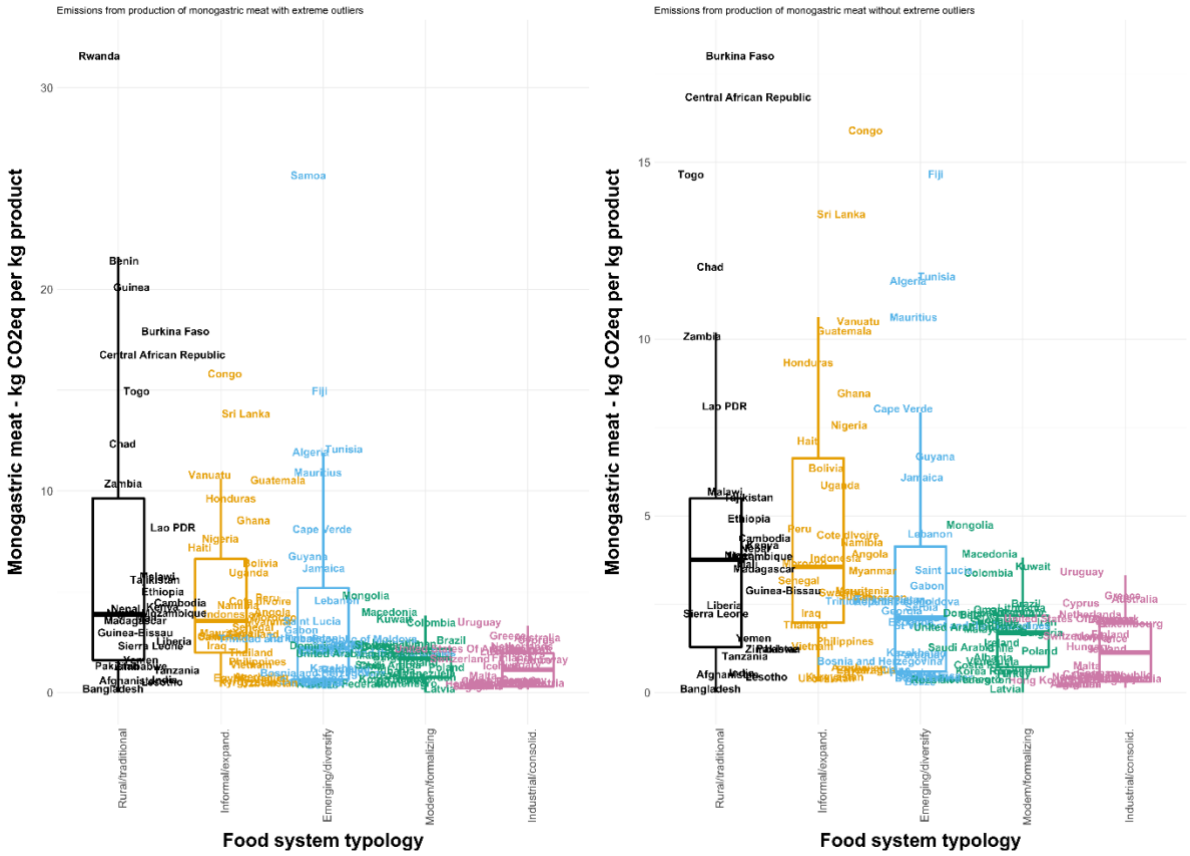
Panel B: Per capital food system emissions (2015)



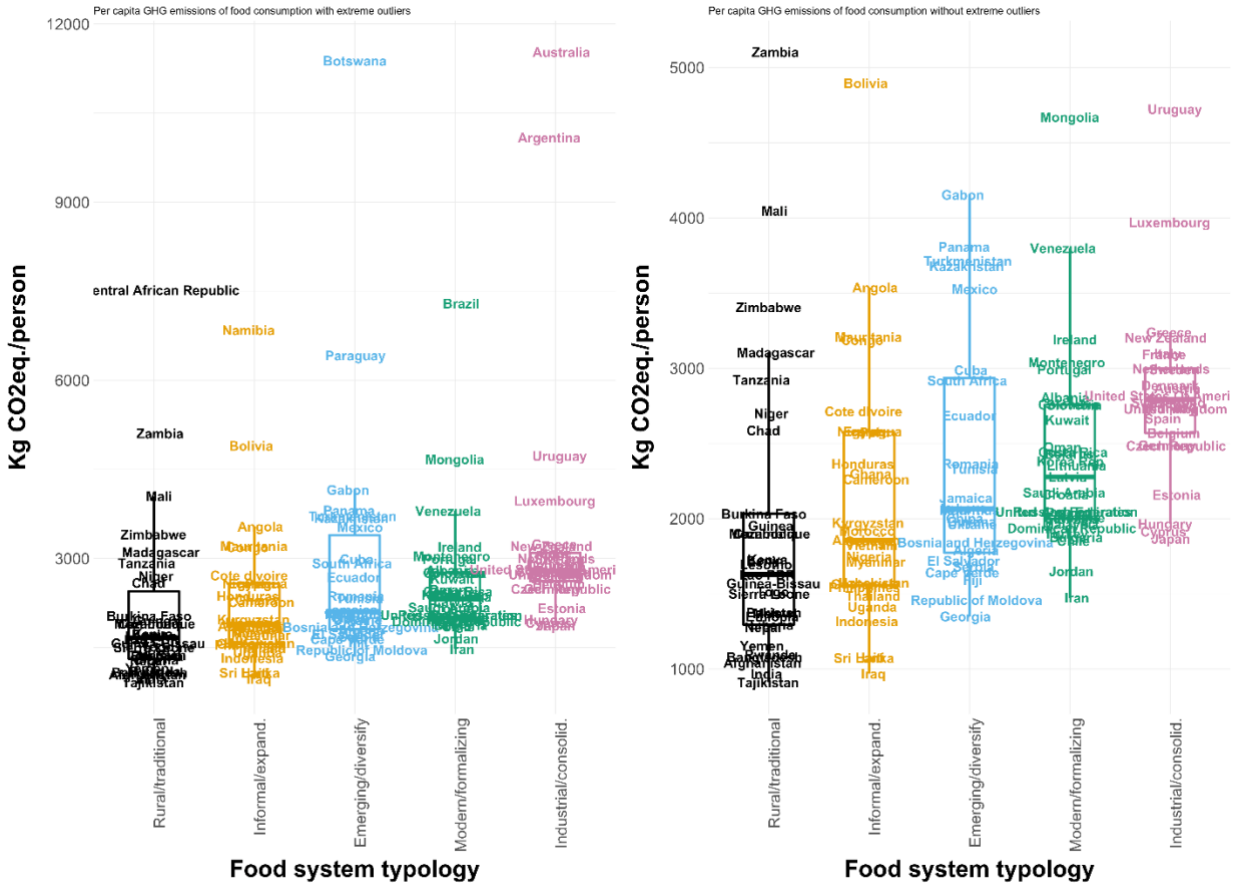
Panel C: Emissions per Kg of ruminant meat with and without outliers



Panel D: Emission per Kg of monogastric meat with and without outliers



Panel E: Ecological Footprint of "Food Consumption" with and without outliers (2010)



Sources: Panels A and B [79]; Panels C and D [23]; Panel E [96]

Supplementary Table 1: Summary of countries included in the various indicators shown in Figures and supplementary materials.

Indicator	Rural and traditional	Informal and expanding	Emerging and diversifying	Modernizing and formalizing	Industrial and consolidated	Year	Source
Typology (n=155 countries)	30 countries; these include: Afghanistan Bangladesh Benin Burkina Faso Cambodia Central African Republic Chad Ethiopia Guinea Guinea-Bissau India Kenya Lao PDR Lesotho Liberia Madagascar, Malawi Mali Mozambique Nepal	31 countries; and these include: Angola Azerbaijan Bolivia Cameroon Congo Cote dIvoire Egypt Ghana Guatemala Haiti Honduras Indonesia Iraq Kyrgyzstan Mauritania Morocco Myanmar Namibia Nicaragua Nigeria	32 countries, these include: Algeria Belize Bosnia and Herzegovina Botswana Cape Verde China Cuba Ecuador El Salvador Fiji Gabon Georgia Guyana Jamaica Kazakhstan Lebanon Maldives Mauritius Mexico Panama	31 countries and these include: Albania Belarus Brazil Bulgaria Chile Colombia Costa Rica Croatia Dominican Republic Iran Ireland Jordan Korea Rep Kuwait Latvia Lithuania Macedonia Malaysia Mongolia Montenegro	31 countries and these include: Argentina Australia Austria Bahamas Belgium Canada Cyprus Czech Republic Denmark Estonia Finland France Germany Greece Hong Kong Hungary Iceland Israel Italy Japan	2018-2019	Marshall et al, 2021

	Niger Pakistan Rwanda Sierra Leone Tajikistan Tanzania Togo Yemen Zambia Zimbabwe	Peru Philippines Senegal Sri Lanka Sudan Swaziland Thailand Uganda Uzbekistan Vanuatu Vietnam	Paraguay Republic of Moldova Romania Saint Lucia Samoa Serbia South Africa St Vincent and the Grenadines Trinidad and Tobago Tunisia Turkmenistan Ukraine	Oman Poland Portugal Russian Federation Saudi Arabia Slovakia Slovenia Suriname Turkey United Arab Emirates Venezuela	Luxembourg Malta Netherlands New Zealand Norway Spain Sweden Switzerland United Kingdom United States Of America Uruguay		
Message 1							
Figure 1: Affordability of Recommended Diet (n= 133, 22 missing)	Missing (3): Afghanistan, Cambodia, Yemen,	Missing (4): Guatemala, Uzbekistan, Vanuatu, St Vincent and the Grenadines	Missing (6): Cuba, Georgia, Lebanon, Turkmenistan, Ukraine, Samoa	Missing (6): Oman, Saudi Arabia, United Arab Emirates, Venezuela, Iran, Kuwait	Missing (3): Bahamas, New Zealand, Hong Kong	2017 prices using 2018 income distribution; India had 2015 income distribution.	Herforth et al, 2020 and SOFI 2020
Figure 2: Poverty headcount (n= 137, 18 missing)	Missing (4): Afghanistan, Cambodia, India, Lesotho	Missing (2): St Vincent and the Grenadines, Ivory coast	Missing (3): Cuba, Oman, Tunisia	Missing (3): Albania, Kuwait, Saudi Arabia,	Missing (6): Australia, Bahamas, Belgium, New Zealand, Hong Kong, Sweden	1990-2019	World Bank
Figure 3, Panel A: Food price indices (ICP) (n=155 countries)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2017	World Bank

Figure 3, Panel B: Domestic nutrient supply (n=155)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2018	FAOSTAT
Message 2							
Figure 4: % Share of employment in agriculture and Gross Domestic Product per capita, current USD (n= 155)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	1961-2020	World Bank, NY.GDP.PCAP.CD
Figure 5: Distribution of Farm Sizes (n= 144, 11 countries missing)	Missing (0):	Missing (2): St Vincent and the Grenadines, Vanuatu	Missing (5): Cape Verde, Fiji, Maldives, Republic of Moldova, Samoa	Missing (0):	Missing (4): Bahamas, Hong Kong, Iceland, Malta	2005	Herrero et al, 2017
Figure 6: Share of the workforce employed in agri-food systems (2009-2020), by food system typology	Missing (9): Afghanistan, Benin, Central African Republic, Guinea, Guinea-Bissau, Kenya, Malawi, Tajikistan, Yemen	Missing (9) Azerbaijan, Cameroon, Haiti, Iraq, Morrocco, Nicaragua, Nigeria, Senegal, Uzbekistan,	Missing (17): Algeria, Belize, Cape Verde, China, Cuba, Gabon, Jamaica, Kazakhstan, Paraguay, Republic of Moldova, South Africa, St. Vincent and the Grenadines, Trinidad and Tobago, Tunisia, Turkmenistan, Ukraine	Missing (9) Belarus, Chile, Korea republic, Kuwait, Malayasia, Oman, Russia Federation, Saudi Arabia, Venezuela	Missing (7) Argentina, Australia, Bahamas, Canada, Hong Kong Japan, New Zealand	2000-2020, 87% 2010 are above	FAO working group on AFS employment. (RA, KS, BD, PW, "A new method for estimating global and country level employment in Agri-food systems").
Message 3							
Figure 7: Food system emissions (n= 153, missing 2)	Missing (0)	Missing (0)	Missing (1) Serbia	Missing (1) Montenegro	Missing (0)	2015; Serbia and Montenegro are combined as 1 country in Crippa et al and as 2 countries in FST	Crippa et al, 2021
Figure 8: Proportion of the urban population by typology in 2015 (top).	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	1990-2020	UN, Department of economic and social affairs and population division.
Figure 8: Rates of urbanization from 1990-2020 (bottom)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2015	Cattaneo et al, 2021

Figure 9 (Panel A): % Mortality attributed to dietary related risk factors (n= 154, missing 1)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (1): Hong Kong	2019	Afshin et al, 2019
Figure 9 (Panel B): Ecological footprint of consumption (n=141, missing 14)	Missing (0)	Missing (3): Sudan, Swaziland, Vanuatu	Missing (6): Belize, Maldives, Saint Lucia, Samoa, St. Vincent and the Grenadines, Trinidad and Tobago	Missing (1): Macedonia	Missing (4): Bahamas, Malta, Hong Kong, Iceland	2010	"Bending the Curve" by the World Wildlife Foundation
Figure 9 (Panel C): Mongastric meat (n= 155)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2017	FAOSTAT
Figure 9 (Panel D): Ruminant meat (n= 155)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2017	FAOSTAT
Supplement Figures							
Supplementary Figure 1: Map of food system typology	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2018-2019	Marshall et al, 2021
Supplement Figure 2: Price Level Index over all Food Groups by Food System Typology	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2017	World Bank
Supplement Figure 3: Median food and protein supply, loss, imports, exports by food system typology	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2018	FAOSTAT
Supplement Figure 4: Change in land and labor productivity over time, by food system typology (1960-2016) (n=150 countries, 5 countries missing)	Missing (0)	Missing (0)	Missing (4): Maldives, Saint Lucia, Samoa, Serbia	Missing (0)	Missing (1): Hong Kong	1960-2016	USDA ERS, International Agricultural Productivity

Supplement Figure 5: Human development over time by food system typology (n= 155 countries)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	1980-2021	UNDP
Supplement Figure 6: Gini over time by food system typology (n =145, 10 countries missing)	Missing (2): Afghanistan, Cambodia	Missing (0):	Missing (2): Cuba, St. Vincent and the Grenadines	Missing (3): Kuwait, Saudi Arabia, Oman	Missing (3): Bahamas, Hong Kong, New Zealand	1980-2021; indicators name: SI.POV.GINI	World Bank
Supplementary Figure 7: GDP per capita over time in internal dollars	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	1990-2020; indicator name: NY.GDP.PCAP.PP.CD	World Bank
Supplementary Figure 8 : Workforce employed in the agri-food system and agriculture, using ISIC version 4.0 (n=104, 51 missing)	Missing (9): Afghanistan, Benin, Central African Republic, Guinea, Guinea-Bissau, Kenya, Malawi, Tajikistan, Yemen	Missing (9) Azerbaijan, Cameroon, Haiti, Iraq, Morrocco, Nicaragua, Nigeria, Senegal, Uzbekistan,	Missing (17): Algeria, Belize, Cape Verde, China, Cuba, Gabon, Jamaica, Kazakhstan, Paraguay, Republic of Moldova, South Africa, St. Vincent and the Grenadines, Trinidad and Tobago, Tunisia, Turkmenistan, Ukraine	Missing (9) Belarus, Chile, Korea republic, Kuwait, Malayasia, Oman, Russia Federation, Saudi Arabia, Venezuela	Missing (7) Argentina, Australia, Bahamas, Canada, Hong Kong Japan, New Zealand	2000-2020, 87% 2010 are above	FAO working group on AFS employment.
Supplement Figure 9: Mean population density across rural-urban continuum categories by food system typology (n= 155 countries)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2015	Cattaneo et al, 2021
Supplement Figure 10:							
Panel A: Total food system emissions (1990-2015)	Missing (0)	Missing (0)	Missing (1) Serbia	Missing (1) Montenegro	Missing (0)	1990-2015; Serbia and Montenegro are combined as 1 country in Crippa et al and 2 countries in FST	Crippa et al
Panel B: Per capital food system emissions (2015)	Missing (0)	Missing (0)	Missing (1) Serbia	Missing (1) Montenegro	Missing (0)	2015; Serbia and Montenegro are combined as 1 country	Crippa et al Divided by world population in 2015,

						in Crippa et al and 2 countries in FST	obtained from World Bank
Panel C: Emissions per Kg of ruminant meat with and without outliers	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2017	FAOSTAT
Panel D: Emissions per Kg of monogastric meat with and without outliers	Missing (0)	Missing (0)	Missing (0)	Missing (0)	Missing (0)	2017	FAOSTAT
Panel E: Ecological Footprint of "Food Consumption" with and without outliers	Missing (0)	Missing (3): Sudan, Swaziland, Vanuatu	Missing (6): Belize, Maldives, Saint Lucia, Samoa, St. Vincent and the Grenadines, Trinidad and Tobago	Missing (1): Macedonia	Missing (4): Bahamas, Malta, Hong Kong, Iceland	2010	Foodsystemdashboard ; "Bending the Curve" by the World Wildlife Foundation