1 Sustainability-related Datasets

The datasets comprise 110 time series collections spanning various application domains and pattern types, obtained from the FAO database [1]. FAO provides free access to food and agriculture data, including production, trade, consumption, and environmental indicators. Six datasets were selected: GDP (gross domestic product), bioenergy, climate change, fertilizer production, greenhouse gas emissions, and pesticide use. Data were collected for the ten largest global economies in 2024, as identified by the International Monetary Fund [2]: United States, China, India, Germany, Japan, United Kingdom, France, Brazil, Canada, and Italy – in descending order of size. The time series range from 30 to 60 annual observations, representing a data-scarce scenario. Table 1 summarizes the datasets.

Table 1: Macroeconomic and environmental indicators from FAOSTAT

Dataset	**Description**	**Frequency**	**Coverage**	**Series**	**Observations**	**Pred. Length**
Bioenergy (Consumption)	Final energy consumption of various bioenergy fuels by country, measured in terajoules	1Y	1990–2022	10	33	5
Bioenergy (Production)	Total production of various bioenergy fuels by country, measured in terajoules	1Y	1990–2022	10	33	5
Climate Change	Mean absolute variation in surface temperature by country, expressed in °C	1Y	1961–2023	10	63	5
Emissions (CH_4)	Total amount of methane released into the atmosphere by country, in kilotons	1Y	1961–2021	10	61	5
Emissions (CO_2)	Total amount of carbon dioxide released into the atmosphere by country, in kilotons	1Y	1990–2021	10	32	5
Emissions (N_2O)	Total amount of nitrous oxide released into the atmosphere by country, in kilotons	1Y	1961–2021	10	61	5
Fertilizers (K_2O)	Tonnes of potassium nutrient manufactured into fertilizer products by country	1Y	1961–2022	10	62	5
Fertilizers (N)	Tonnes of nitrogen nutrient manufactured into fertilizer products by country	1Y	1961–2022	10	62	5
Fertilizers (P_2O_5)	Tonnes of phosphorus nutrient manufactured into fertilizer products by country	1Y	1961–2022	10	62	5
GDP	Total value of all goods and services produced within a country, expressed in dollars	1Y	1970–2023	10	54	5
Pesticides	Agricultural use of pesticides and related chemicals by country, measured in tonnes	1Y	1990–2022	10	33	5

2 M-Competition Datasets

Table 2: Datasets from the Makridakis Forecasting Competitions (M-Competitions)

Dataset	Frequency	Series	Observations	Pred. Length
M1 (Monthly)	1M	617	48 – 150	18
M1 (Quarterly)	3M	203	18 – 114	8
M1 (Yearly)	1Y	181	15 – 58	6
M3 (Monthly)	1M	1,428	66 – 144	18
M3 (Not Mentioned)	–	174	71 – 104	8
M3 (Quarterly)	3M	756	24 – 72	8
M3 (Yearly)	1Y	645	20 – 47	6
M4 (Daily)	1D	4,227	107 – 9933	14
M4 (Hourly)	1H	414	748 – 1,008	48
M4 (Monthly)	1M	48,000	60 – 2,812	18
M4 (Quarterly)	3M	24,000	28 – 874	8
M4 (Weekly)	1W	359	93 – 2,610	13
M4 (Yearly)	1Y	23,000	19 – 841	6

References

[1] FAO. Food and agriculture data. https://www.fao.org/faostat, 2025.

[2] IMF, International Monetary Fund. World Economic Outlook-Steady but Slow: Resilience amid Divergence. Technical report, International Monetary Fund, Washington, USA, 2024. `https://www.imf.org/external/datamapper/NGDPD@WEO/OEMDC/ADVEC/WEOWORLD`.