

# Examining Japan's Growth and Development Post WWII.

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*Abstract—The project aims to analyze Japan's growth and development post World War 2 till 2019, focusing on social, political, environmental and economic indicators other than growth. Japan is a fascinating case study because of its unique history and impressive economic growth after the devastations of World War II. Moreover, Japan has been a significant player in global affairs for many years, and Japan's economic growth is often cited as a model for other countries.*

*However, despite the massive economic success, there are concerns about Japan's ability to sustain this growth and address more development challenges, such as environmental sustainability and demographic change. Therefore, assessing whether this growth has translated into broader development is essential. This project will examine Japan's experience post WWII, including rapid growth and economic stagnation. This project will comprehensively assess Japan's growth and development experience by analyzing social, political, environmental, and economic indicators. The findings will help understand the relationship between economic growth and development and identify areas where Japan needs to improve to achieve more balanced development.*

## I. INTRODUCTION

Most studies often praise Japan's economy for recovering WWII aftereffects within two decades and growing to a global economic superpower subsequently. However, growth is a means to development instead of an end. Therefore, it is equally important to assess Japan on other development indicators. This study analyses various indicators and shows how growth does not equate to development, as some indicators have lagged. For instance, Japan's ageing population challenges its social development, while environmental issues such as climate change and pollution remain a concern till date.

As development is not just a GDP growth, we aim to uncover the importance of various indicators such as social, political, environmental and economic factors that have played a crucial role in the country's growth and development. At the same time, we perform the economic breakdown of the Land of the Rising Sun. Below we list the major historical events, policies and cultural practices that we will be analyzing to understand in detail the economy of Japan, how it was influenced by foreign powers and how it influenced the world's economy.

### A. Economic Analysis of Japan

Multiple significant events in Japan's history have been crucial in defining the country's economy post WWII. We look at some of these major historical events and how they've been vital in deciding the country's economic future to understand how Japan's economy became a shadow of its own.

1) **Japan Post World War II:** The empire of Japan surrendered and ended World War II (WWII) after the atomic bombings of Hiroshima and Nagasaki. Japan had suffered a significant to its industry, national infrastructure and military. The crumbling GNP, along with poverty and upcoming famine, was concerning.

The period known as Occupied Japan followed after WWII, during which the Allied forces revised the Japanese constitution and demilitarized Japan, along with several social, economic, educational and land reforms. The Labor Standards Act of 1947 and the Trade Union Acts were passed to elevate the status of workers and improve their working conditions. The Treaty of San Francisco (1952) re-established peaceful relations between Japan and Allied Powers, ended the post-war occupation of Japan, and returned full sovereignty to it.

2) **Japan's Economic Miracle (1953-1960s):** Merely 20 years later, Japan was the world's second-largest economy. Economists refer to this period of rapid economic growth (average of 9%) between 1953 to 1971 as Japan's post-war economic miracle.

The chief architect of this economic miracle was Hayato Ikeda. He was the Minister of Finances in 1949 and 1956 and oversaw the development of the Bank of Japan (BoJ). He was the Minister of International Trade and Industry (MITI) in 1952 and 1959; the Prime Minister of Japan from 1960 to 1964.

This economic miracle is believed to be a result of the following -

- 2.1. **Reforms during Japan Occupation** - Political, economic and civic changes, along with the efforts by the US to rebuild the economic infrastructure, proved to be a launching pad.
- 2.2. **Korean War** - Japan became a chief supplier of equipment, logistics and munitions to the US, stimulating the Japanese economy. [1]
- 2.3. **MITI** - Introduced the Inclined Production Mode to increase the production of raw materials and encouraged more women to enter labour markets.
- 2.4. **Keiretsu** - Cooperations of manufacturers, suppliers, and distributors which work together for long-term growth. The policy of window guidance [7] proved beneficial for the Keiretsu as it made loans and credits more accessible.
- 2.5. **BOJ** - Overloaning allowed the BoJ to control the dependent local banks more. The Keiretsu used their collaboration with MITI and BoJ to allocate resources efficiently.

### 3) *The Golden Sixties:*

a) **The Income Doubling Plan:** Under the leadership of Hayato Ikeda, this programme aimed at doubling the size of Japan's economy in ten years through a combination of tax breaks, lowered interest rates and targeted investments in infrastructure and communication sectors with incentives to increase exports and industrial developments. These measures gave an average annual growth of more than 10%, and the economy doubled in less than seven years. [2]

b) **Foreign Exchange Plan:** System of import controls designed to prevent the flooding of Japan's markets by foreign goods. Reduction in taxes meant that the Japanese economy was more liberalized, and there was a higher accumulation and better allocation of resources.

Ikeda furthered Japan's global economic integration by negotiating for Japan's entry into the OECD in 1964. By the time Ikeda left office, the GNP was growing at a phenomenal rate of 13.9%.

### 4) *Crisis in 1970-80s:*

- 4.1. **Oil Crisis (1973)** - Oil embargo was proclaimed by OAPEC - Organization of Arab Petroleum Exporting Countries. One of the major impacts was the increased production and transportation costs, leading to increased prices and ultimately reduced production and economic activity. [4]
- 4.2. **Trade Dumping (1978)** - Japan's MITI provided subsidies illegally under international law to help Japanese companies in the semiconductor industry to sell chips at artificially low prices in the USA while keeping prices high in Japan.
- 4.3. **Oil Crisis (1979)** - Japan was now forced to look for alternative energy sources and invested heavily in nuclear power. Inflation peaked, and Japan shifted its investments to electronics and semiconductors. [5] [6]
- 4.4. **Japan Bashing (1980)** - Criticism by American manufacturers of the emergence of Japan as the economic powerhouse and accusations of unfair trade practices such as Trade Dumping and currency manipulation. This increased pressure on the Yen as tariffs and trade restrictions increased on Japanese products.

### 5) *Formation of the Bubble Economy (1985 to 1991):*

The Plaza Accord (1985) was a meeting among the USA, Germany, France, UK and Japanese bank leaders to discuss the Dollar getting too strong; to depreciate the Dollar against the Japanese Yen and the German Mark. The US would allow the Dollar to decline, and Germany and Japan would focus on increasing domestic demand for products to appreciate their currencies. However, with the Yen appreciating, the exports got much more expensive, and the imports got cheaper. The BoJ handled this in 2 ways -

- 5.1. **Monetary Policy** - Interest rates were lowered so

people pay less on debt obligations, and money is spared for consumer spending.

- 5.2. **Fiscal Policy** - Increased public spending by the government on infrastructure and social welfare programmes.

The macroeconomic stimulus packages pumped into the economy were to trigger domestic spending and compensate for the anticipated export loss due to the growing Yen.

Credit was now easily accessible as the interest rates were meagre. Corporations began acquiring land; people pumped money into stocks bloating both markets. As it was easier to borrow, people used bought properties as collateral to borrow more and more. The debts kept on increasing with increasing prices and became out of reach for younger people.

In 5 years, from 1985 to 1990, real estate skyrocketed by 167%, the stock market doubled, and Japan's economy grew at 5% annually. [8] [9]

6) **The Collapse of the Bubble Economy (1991):** This growth was difficult to sustain, and the government increased interest rates in 1989. Suddenly credit wasn't that accessible, which meant the real estate value fell, and the stock market plummeted. Companies' profits were reduced because they profited more from the shares and real estate than from selling their products. The economy stagnated for the next decade from 1991 to 2001, referred to as the Lost Decade. [3]

It has been 30 years, and Japan still needs to recover. Japan's real GDP in 1994 was \$4.9 trillion, and today in 2023 is \$4.9 trillion, reflecting that the country hasn't seen any real growth in the last 30 years. [11]

7) **Aftermath and Deflation:** The stock market plummeted 63% from an all-time high, reducing consumer confidence in the economy and reducing consumption and investment in Japan. The growth has been so stagnant that the country faces deflation, making goods cheaper yearly, prompting people to save more to buy something better next year. This results in people holding on to their money and consumer spending coming to a staggering halt. [15]

8) **Crisis in 2000s:** Japan's economy suffered many blows due to multiple financial crisis that shook the world. Some of them are-

- 8.1. **Asian Financial Crisis (1999)** - high levels of debt and overvalued currencies of SouthEast Asian countries resulted in the withdrawal of large investments and increased non-performing loans.
- 8.2. **Dot Com Recession (2000)** - The tech bubble burst led to contraction in global trade demand and forced the export-oriented country to diversify the economy, pushing the stock market down to 7500 points.
- 8.3. **Great Recession (2008)** - resulted in a sharp decline in stock prices and a global financial crisis resulting in interest rate cuts, laying off

workers and asset purchase programs to mitigate the recession.

9) **Abenomics**: Abenomics refers to a set of policies introduced by Shinzo Abe in 2012 to boost Japan's economic growth and combat inflation by changing labour laws, increasing money supply and encouraging more women participation. Mainly two policies were proposed.

- 9.1. **Quantitative Easing** - injecting liquidity into the economy and shifting to higher-yielding assets to promote economic growth. Loads of money was printed to fight off deflation and double the amount of Yen in circulation.
- 9.2. **Fiscal Policy** - Boosting government spending, investment in projects, and lower taxes increases the consumption rate and stimulates the economy.

Under Abenomics, the Tokyo and Osaka Stock exchanges merged so that both resources could be pooled to increase liquidity and create a more efficient, competitive, globally integrated capital market system to attract foreign investment.

In 2016, the BoJ reduced the interest rate to -0.1% as a part of its easing policies to boost the economy and combat deflation. BoJ remains the only central bank of any developed country to keep interest rates in the negative domain.

#### 10) *The current Japanese economy:*

- 10.1. **Extremely Low FDIs** - UN ranks Japan second last, just above North Korea, when ranking countries based on FDIs in terms of percentage of GDP. The average for developed countries is 44%, whereas 4% for Japan.
- 10.2. **Modifications to Foreign Exchange Laws and Foreign Trade Laws** - Japan has decreased the threshold for seeking government approval in corporate transactions even with the shallow FDI rate. In a recent amendment, the threshold was decreased from 10% to 1% [12]
- 10.3. **Yen Carry Trade** - The low-interest rates make the investors borrow money at low-cost Yen and then invest in high-paying currencies like the US Dollar. This makes the Yen demand higher, shrinks exports, and halts the minimum inflation required to keep the economy running. Big Mac Index by the Economist Magazine [13] suggests that a Big Mac burger is 70% more expensive in New York than Japan, reflecting the currency's decreasing purchasing power. [14]
- 10.4. **Debt to GDP** ratio of over 75% for a more extended period could have a poor impact on economic growth. Japan's debt of 9.8 trillion US Dollars is over 263% of its GDP, the highest in the world, making it the most indebted country on the planet.

Fig. 1. Debt-to-GDP Ratio

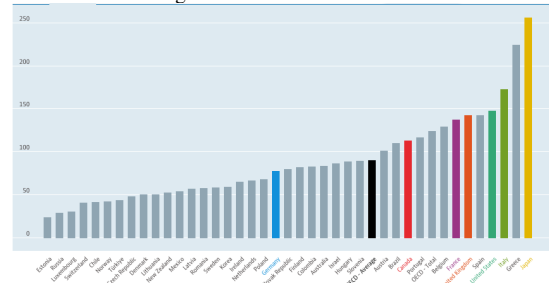


Fig. 2. FDI Inward Stocks

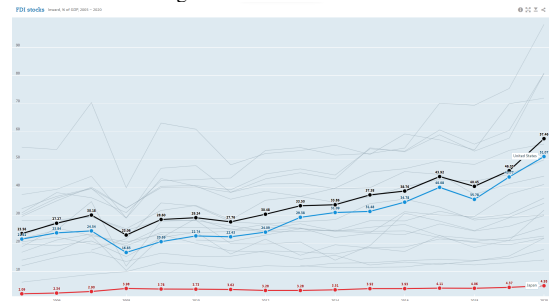


Fig. 3. GDP in US\$

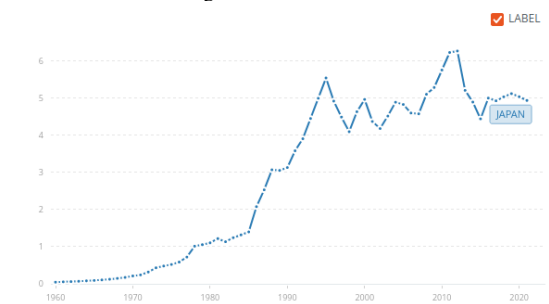


Fig. 4. Housing Prices

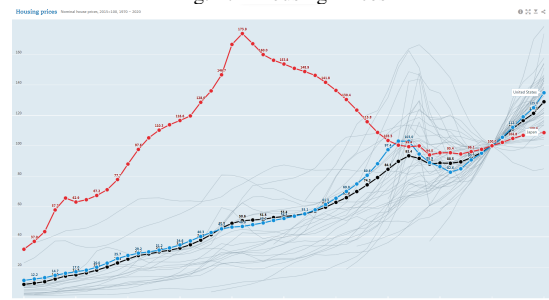


Fig. 5. Inflation Rates



Fig. 6. Interest Rates by central bank

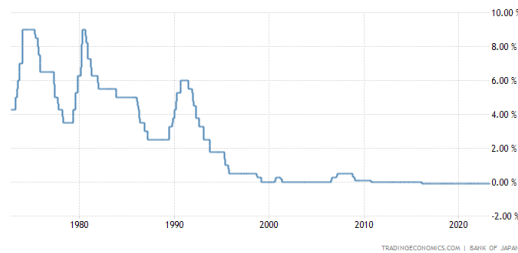


Fig. 7. Nikkei Index

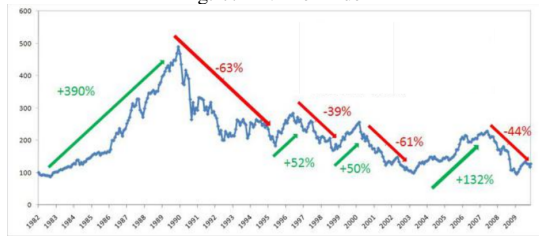
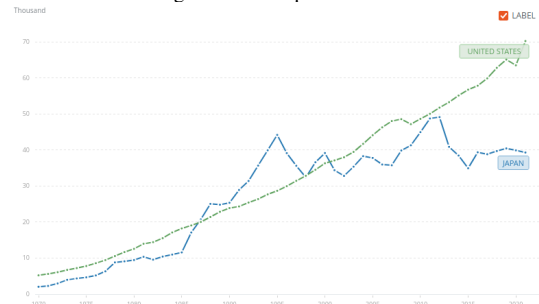


Fig. 8. Nikkei Index



Fig. 9. Per-Capita income



## B. Environmental Analysis of Japan

In this section, we will assess the environmental indicators across three time-periods, i.e. The economic miracle post WWII, the lost decade and the 21st century. And our findings are as follows:

### 1) The Economic Miracle and Pollution Debacle:

Focusing on rapid industrialisation, export-oriented industries, high investment in R&D, and close collaboration between government, industry, and academia, Japan became the world's second-largest economy in the late 20th Century. And by 1976, the Japanese economy had grown 55 times its size in 1946. Therefore, it is evident that the Japanese government prioritised economic output in the industrialization-pollution tradeoff, and therefore, the Japanese economic miracle also parallels a **"pollution debacle"** within the country. As a result, Japan has faced several environmental issues, such as air pollution, waste management, and water contamination to date.

The most noted problem in this period was probably the extremely intensified pollution in urban areas.[16] The dependency on fossil fuels in industry and homes and unregulated industrial emissions have resulted in widespread urban air pollution. Atmospheric concentrations of SO<sub>2</sub> increased from 0.015 ppm in 1960 to 0.06 ppm in 1965, and Nitrogen oxide(s) (NO<sub>2</sub>, NO<sub>x</sub>) rose from 0.005 ppm in 1960 to 0.03 ppm in 1980, with no sign of decline as the number of automobiles in the country rose rapidly in Japan. And rapid infrastructure growth in Tokyo for the 1964 Olympics acted as a catalyst for air pollution in the city. During the 1950s and 1960s, Osaka has proudly proclaimed the **"capital of smoke"** (Kemuri no Miyako)[17].

Apart from high levels of air pollution in urban industrial areas, water contamination was also a primary concern during this period. Industrial discharges, poor wastewater treatment, and inappropriate disposal of chemicals polluted rivers, lakes, and coastal regions, resulting in hazardous waste, posing environmental and health problems. Water pollution endangered aquatic habitats, biodiversity, and clean water supply for drinking and agriculture. Heavy metals, chemicals, and pollutants contaminated the soil due to industrial operations, notably in the manufacturing and mining industries, which threatened agricultural production, food safety, and human health.

Although the rules and regulations on industrial operations were relatively weak in that era, the government realised the need for the same after Japan encountered the dreaded **"Four Big Pollution Diseases"**, which consisted of the following:

- 1) **Minamata Disease** [18] (1956-present), one of Japan's most prominent pollution events, was caused when a chemical firm, New Nippon Nitrogen Co, dumped methylmercury-containing industrial effluent into the bay, contaminating shellfish and harming inhabitants who ate the infected fish, causing severe neurological problems and developmental impairments.

- 2) **Yokkaichi Asthma** [19] (1960s-1970s) was severe in Yokkaichi, an industrial city noted for its petrochemical and refinery complexes. SO<sub>2</sub> and NO<sub>2</sub> emissions from industry and power plants induced respiratory issues and a high prevalence of bronchial asthma.
- 3) **Itai-itai Disease** [20] (1960s-1970s), also known as "ouch-ouch disease", was caused by cadmium contamination in Toyama Prefecture. Cadmium-containing effluent discharged by Mitsui Metal and Mining Co. affected rice paddies and water supplies, resulting in cadmium buildup in the food chain.
- 4) **Niigata Minamata Disease** [21] (1965-1968), similar to Minamata Disease. A Showa Denko Co chemical facility in Niigata dumped mercury-containing effluent into the Agano River, polluting fish and causing mercury poisoning in locals who ate the infected fish.

These fatalities sparked several court proceedings and public outcry, resulting in campaigns for stricter emission limits and pollution laws. As a result, during the early 1960s, the Japanese government recognised the need for a complete shift in pollution-control measures and began developing pollution-control policies. In 1967 Japan passed the **Basic Law for Environmental Pollution Control**, the first of its kind in the world and aimed to prevent and control environmental pollution and safeguard public health. Four years later, in 1971, Japan formed the **Environmental Agency**, which was critical in developing and implementing legislation about pollution control, waste management, conservation, and environmental impact assessments. Moreover, the agency's responsibilities evolved with time, culminating in its reformation as the **Ministry of the Environment** in 2001.

## 2) *The Lost Decade and the Decade of Initiatives:*

After the economic miracle period was over and the country entered the lost decade, the era of economic stagnation and poor development that followed the early 1990s collapse of the country's asset bubble. During this period, Japan experienced several environmental concerns, as well as economic hardships. Japan's pollution problems persisted, particularly in metropolitan areas such as Tokyo. The high population density and excessive reliance on transportation and industry exacerbated air pollution from car emissions and industrial activity. Japan's reliance on fossil fuels for energy has worsened environmental issues, resulting in higher GHG emissions and a more significant carbon footprint. Waste management was also a challenge, with waste from prior years, especially incoming electronic waste, necessitating attention. Water contamination from industrial discharges, agricultural runoff, and insufficient wastewater treatment facilities exacerbated environmental problems.

In this decade, Japan not only focused on regulating industrial emissions and minimising air pollution but also accepted the effects of **climate change** and a limit on economic growth due to **natural limits**, emphasising the need for sustainable growth. Temperatures in Japan have

risen annually and seasonally, resulting in more frequent heatwaves and more extended periods of hot weather. This has resulted in various repercussions, including heat-related diseases, more significant pressure on agricultural practices, and higher energy consumption for cooling. Moreover, rising sea levels and ocean acidity are hurting Japan's coastal ecosystems and fisheries and the danger of saltwater intrusion into freshwater sources.

Therefore, besides numerous afforestation programmes, the government promoted renewable energy and upgraded the environmental impact assessment procedure for development projects to minimise adverse environmental consequences. Japan actively participated in international environmental treaties and partnerships, supporting worldwide measures to reduce GHG emissions and exchanging best practices to reduce pollution, encourage sustainable practices, and maintain the long-term health of Japan's ecosystems.

In 1993, the Japanese government introduced **Basic Environment Law** which aims to comprehensively and systematically promote policies for environmental conservation to ensure healthy and cultured living for the nation's present and future generations. It articulates basic principles, clarifying the responsibilities of the State, local governments, corporations and citizens and prescribing the fundamental policy considerations for environmental conservation.[22] This law has played a critical role in developing environmental policies and practices in Japan for over three decades.

Another key event of the lost decade was **The Kyoto Protocol** of 1997, which established carbon reduction objectives for industrialised nations to reduce their annual GHG emissions by 6% below 1990 levels by 2012 to reduce the global impact of climate change. Moreover, it was one of the first global steps towards a sustainable future. Japan was one of the first countries to ratify the pact, revise its domestic climate policy, and concentrate on lowering its annual emissions and transitioning to a low-carbon economy. Its involvement was critical for global efforts to tackle climate change as it is one of the world's most industrialised nations and a significant producer of GHG [23].

3) *The 21st Century and the Era of Action:* The imprints of the "pollution debacle" can be seen even today in the environment of Japan. Although the Japanese government wants to promote green energy at maximum levels, it still confronts additional issues in electronic waste management, reducing consumption from other countries along with climate change. According to a Ministry of Environment report, Japan's coastal wetlands are vanishing at an alarming rate owing to sea-level rise. Waste management seems to be the next big target as the country generates significant plastic and electronic waste from various economic activities. Furthermore, Japan needs to control the whaling practices, which is essential in the whale population collapse and biodiversity loss.

However, on a positive note, Air pollution, particularly in metropolitan areas, has been one of Japan's most severe concerns post-WWII. Now, Japan has firm limits on industrial emissions and car emissions standards, which have resulted in dramatically improved air quality over time. Japan is one of the world leaders in transitioning to greener energy substitutes while rapidly reducing its dependency on carbon-based energy. To achieve sustainable urban development, Japan initiated the **Eco Model City** Programme in 2008, aiming to build ecologically friendly cities that can serve as models for long-term sustainability. This included promoting energy efficiency practices, eco-friendly structures, renewable energy, waste management and reduction, and environmentally friendly transportation [25].

Various Ministry of Environment reports focus on achieving **relative decoupling** by increasing energy efficiency and boosting the use of renewable technology. To promote renewable energy **Feed-In-Tariffs (FITs)** were introduced in 2012, resulting in a significant growth in renewable energy capacity, which enabled Japan to complete its emission reduction initiatives for low-carbon technologies.

As of 2020, Japan ranks 12th of 180 nations with a score of 73.3 on the Yale University **Environmental Performance Index (EPI)**, which assesses nations based on environmental health and ecosystem vitality. Japan aims to obtain a 36-38% renewable energy mix by 2030. And according to the current trend, renewable power is set to account for 34.6% of the energy generation mix in 2030 [26].

Moreover, the **Green Growth Initiatives**[27] followed by the government are as follows:

- Japan has committed to reducing GHG emissions by **26%** from 2013 to 2030 under the United Nations Climate Change Convention.
- Encourage the development of breakthrough technologies by 2050, allowing Japan to contribute to the worldwide reduction of accumulated atmospheric CO<sub>2</sub> to **"Beyond Zero."**
- Attain net zero GHG emissions by 2050. This audacious goal puts Japan on track to become **carbon neutral** in 30 years.

Although these are just speculations and targets, some results in recent years already prove that Japan is achieving green growth by decoupling due to lesser usage of non-renewable resources every consequent years recently. And some of the facts regarding the same are given in the following figure:

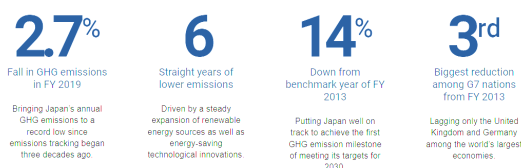


Fig. 10. Recent results of Japan's Green Growth Initiatives

And the results of these efforts can be seen in the following graphs as well,

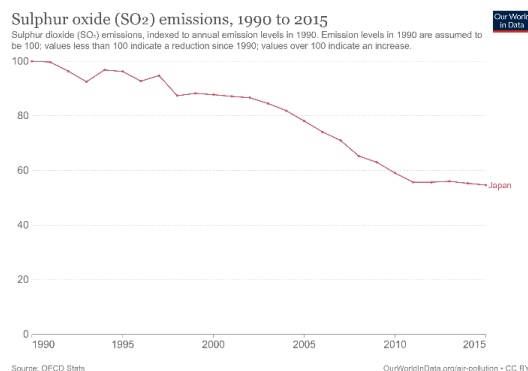


Fig. 11. SO<sub>2</sub> emissions

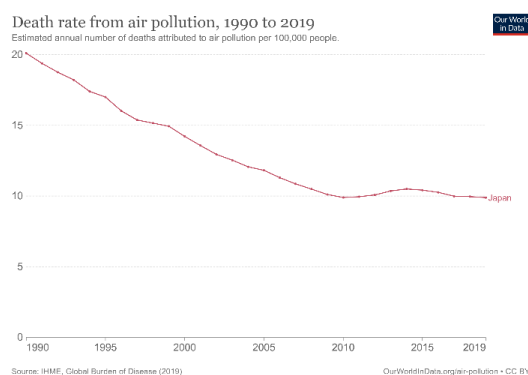


Fig. 12. Death rate from air pollution (1990 to 2019)

And here, we can see a reduction in death rate from air pollution in Japan with a corresponding reduction in emissions of Sulfur Oxide. And now we will see a similar trend in the energy transition in Japan.

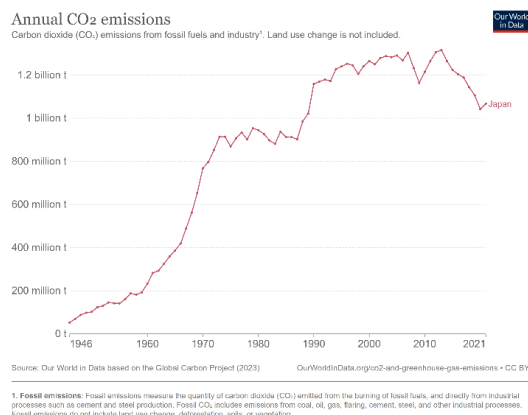


Fig. 13. Annual CO<sub>2</sub> emissions

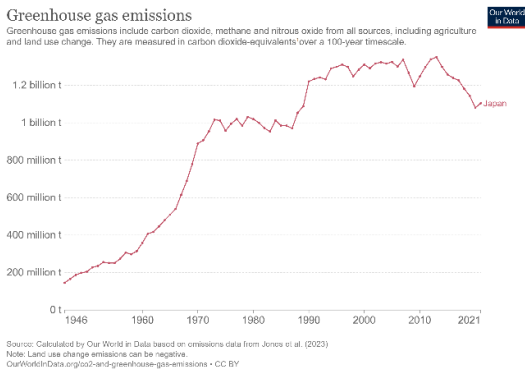


Fig. 14. Greenhouse Gas Emissions

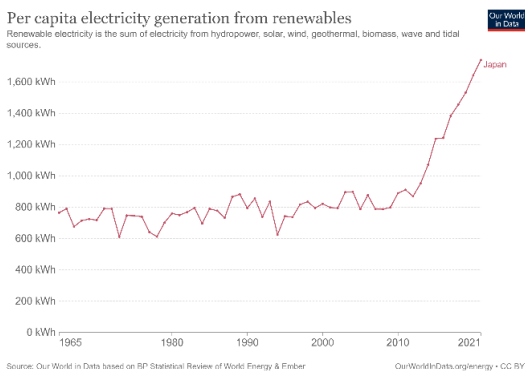


Fig. 15. Per-capita electricity generation from renewables

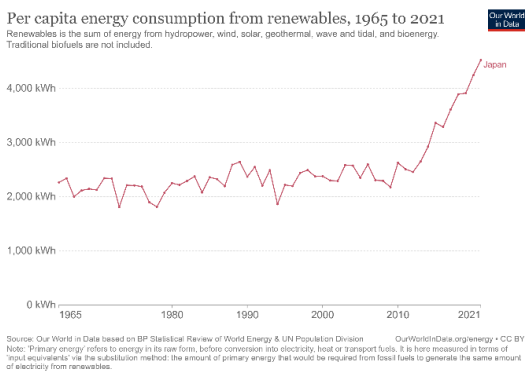


Fig. 16. Per-capita energy consumption from renewables

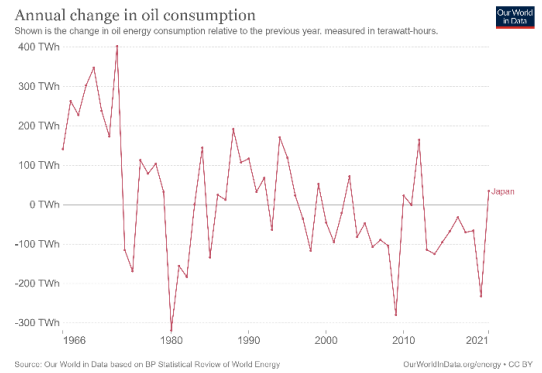


Fig. 17. Annual change in oil consumption

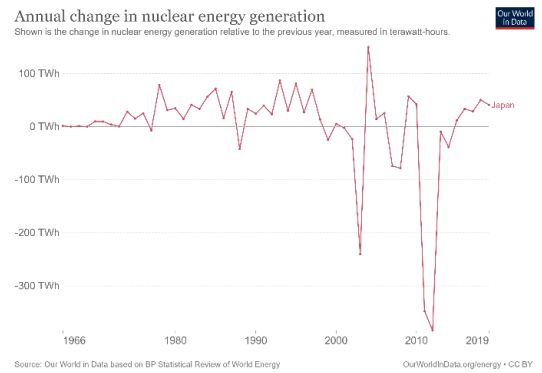


Fig. 18. Annual change in nuclear energy generation

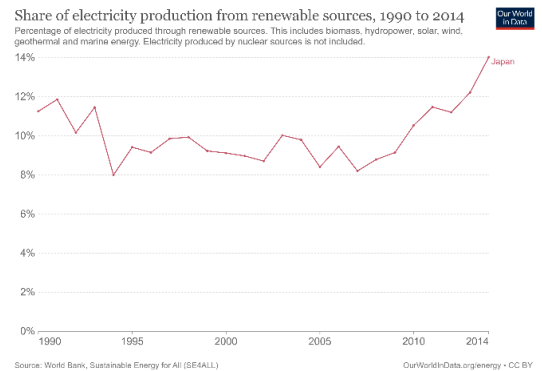


Fig. 19. Share of electricity production from renewable sources



Overall, Japan has progressed economically in the past with tradeoffs, notably in terms of environmental consequences. However, Japan has made tremendous progress in tackling environmental challenges and continues to enact policies and programmes to reduce its environmental effect while sustaining economic growth. And the above figures represent the transition of Japan towards a sustainable future.

## II. CONTRIBUTIONS

The Economic and Environmental Analysis of Japan post World War II is a combined effort and equal of Aaryan Sharma and Akshit Gureja. Regarding the write-up the economic and environmental analysis sections have been written by Akshit Gureja and Aaryan Sharma respectively.

The Social and Political Analysis was a collaboration between Souvik Karfa and Anish Mathur.

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