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**75th Year of Independence:
The Challenges and Opportunities before India In
Contemporary Global Trade Scenario**

Jointly organised by

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Foreword

It is a great privilege for us to present the proceedings of the National Seminar, 2023 to the authors and delegates of the event. We hope that you will find it useful, exciting and inspiring.

The collection of proceedings contains the papers submitted to the National Seminar on “75th year of independence: The challenges and opportunities before India in Contemporary Global Trade Scenario” which was held in Vidyasagar Metropolitan College on 27th May, 2023. The Conference was sponsored by ICSSR-ERC.

The Conference aims to provide a platform for discussing the issues, challenges, opportunities and findings of research on challenges and opportunities before India in Contemporary Global Trade Scenario. It was also spark innovative ideas, foster research relations or partnership between the various institutions. The seminar included two keynote session followed by a session in which there were invaluable presentation by 6 selected presenters.

I would like to take this opportunity to convey my appreciation to the organizing committee for untiring efforts to manage this convention.

I would like to express my sincere appreciations and thanks to all the authors for their contributions to this publication.

I hope that this publication will provide the reader a broad overview of the latest challenges and opportunities before our country and that it will be a valuable reference source for further research.

Dr. Arghya Sarkar
Principal
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Foreword

I am very much happy to know that the Departments of Economics of Vidyasagar Metropolitan College and Netaji Nagar College for Women are going to publish the proceedings of ICSSR-ERC Sponsored National Seminar on a very contemporary issue “75th Year of Independence - The Challenges and Opportunities before India in Contemporary Global Trade Scenario.”

India has become a key player in the global economy since the economic liberalization in the 1990s. India's growth story especially since the start of the 21st century has been remarkable. The Indian economy has come a long way since its economic liberalisation and is among the fastest growing major economies of the world today. While India witnessed a relatively moderate growth during the period 2011-12 to 2013-14 on account of the global economic slowdown, the economy recorded a robust growth averaging 7.5 percent during the period 2014-15 to 2016-17, much above the growth rate of other emerging and developing economies. Recently it has seen major economic policy developments with the introduction of Goods and Services Tax (GST).

In recent years, India's robust growth has been driven by the dynamic private sector. An encouraging phenomenon that has been witnessed has been the emergence of a large number of investment driven small and medium enterprises with immense potential for growth. A large number of enterprises have also endeavoured to expand their business operations overseas. The Indian economy is more globalised than we could imagine. As a result, India's foreign trade has seen a multi-fold increase since the liberalisation of the economy.

Accordingly, there have been significant structural shifts not only in the product basket but also in the geographical composition of India's foreign trade. The opening up of the Indian economy led to a massive increase in the foreign trade which aided in sustained GDP growth over the last two decades.

During the last 25 years, India's exports have increased by 17 times and imports by 19 times. India's share in global merchandise exports has risen from 0.6 percent in 1990s to 1.7 percent in 2016 and similarly the share of imports has risen from 0.6 percent to 2.4 percent during the same period, India's trade to GDP ratio, a measure of an economy's openness and integration into the global economy, has witnessed a phenomenal increase over the last few decades. Foreign trade, which constituted around 13.15 percent of Indian GDP in the early 1990s, peaked at 55 percent in 2012 to 2013 and accounts for around 40 percent in 2016-17. India also ranked as the 20th largest exporter and 14th largest importer in the world in 2016. Consequently, India's engagement with the Global Value Chains (GVCs), which have become dominant feature of world trade, has increased significantly since the 1990s. In the manufacturing sector, especially for electrical and optical equipments, India is more integrated with the South East Asian Region, while for Services the integration in GVCs is with Western countries like the U.S. and U.K.

While the global economic scenario is crucial, the domestic factors are no less important, when it comes to trade. India's overall trade policy faces certain challenges such as inadequate exports, diversifications in terms of products and geographical distribution, insignificant involvement of a majority of states in exports, rationalisation of the tariff regime and export promotion schemes and factor market reforms which are entirely linked with export performance. The challenges not only affects the productivity and competitiveness of domestic firms but also restricts them from participating in the global production networks. The biggest challenge is to employ the

surplus labor coming out of agriculture into industry and services.

Following the global COVID-19 pandemic, India's foreign trade has successfully rebounded from the pandemic-induced lows and has once again become a key driver of India's GDP growth and a major component of India's total GDP. The Indian economy has slowed due to factors related to the global COVID-19 pandemic. Moreover, after Indian GDP declined by 7.3 percent in 2020, the IMF estimated Indian GDP **growth** to achieve 9.0 percent in 2021. The Indian economy is projected to grow by 6.4 percent *in 2022*. *India jumped 3 places to become the United States' ninth largest trading partner in 2021.*

Trade and output will be weighed down by several related shocks including the war in Ukraine, high energy prices, inflation and monetary tightening. Ukraine war could also undermine business and consumer confidence and destabilize the global economy.

In recent years, India has become a major destination for services outsourcing, with many major foreign multinationals using India's good labor market conditions *for outsourcing their back office operations and* business process operations (BPO), India's services exports have remained a bright spot, and merchandise exports have also returned to pre-pandemic levels after 2021.

The Make in India initiative is an important initiative of the Government of India, which envisages to promote India as a manufacturing hub and investment destination. The objectives *are* to double India's share of world trade, to make India a hub *for* global value chains under the Make in India flagship programme, to boost foreign investment inflows by modernising regulations, and to attract more savings from Indians living abroad. There is need for highlighting the potential and stimulating the manufacturing sector through supporting *mechanisms and conducive policy* measures, including *support for R&D*, technology orientation and investment initiatives.

During Azadi Ka Amrit Mahotsav, India's overall exports are projected to scale new heights, growing at 13.34 percent during F.Y. 2022-23 over F.Y. 2021-22 to achieve USD 770.18 billion worth of exports. Merchandise exports have registered highest ever annual export of USD 447.46 billion with 6 percent growth during F.Y. 2022-23 surpassing the previous year's record export of USD 422 billion. Services exports led the overall *exports* growth and is *projected* to set a new *record* annual value of USD 322.72 billion with growth rate at 26.79 percent during F.Y. 2022- 23 over F.Y. 2021-22.

In the current global scenario, this appears to be a difficult task, concerted efforts should be made so that India can achieve its trade target and realign its foreign trade policy with the new global trading system. While the global economic scenario is crucial, domestic factors are no less important in trade. A demand driven export basket variety approach could provide a strong boost to exports. While India has made remarkable progress in the recent past, it faces an even more difficult global environment. Getting India to reposition itself as an important engine of global economic growth is a difficult task, but possible.

With the above thought in mind, the Department of Economics of Vidyasagar Metropolitan College and Netaji Nagar College for Women has thought it prudent to organise the Seminar to explore, exchange and cultivate information about India's struggle and achievements in context of Global Trade Scenario.

We gratefully acknowledge ICSSR-ERC for their approval and financial assistance in the Seminar. Thanks are also extended to the Principal and Teachers of Vidyasagar Metropolitan College, Kolkata, for collaboration.

Thanks are due to the joint conveners, Dr. Suparna Nandy Pal & Dr. Debasish Joddar of Vidyasagar Metropolitan College and Dr. Bipul De and Dr. Soma Saha of Netaji Nagar College For Women and the teaching and non-teaching Staff of the said colleges, President and Members of the Governing Body and students of both the colleges for making the Seminar a grand success.

It has always been our endeavour in these Colleges to expose our students to interactions with experts in the field of their study so that they can feel motivated towards future career path in higher studies and research. Organizing seminar on very modern aspects of a subject such as this, takes the students to a different level and to what lies beyond.

I am sure that this volume will serve as a worthwhile reference for students, teachers and researchers in this field.

Dr. Tapan Kumar Ghosh,
Principal,
Netaji Nagar College for Women.

Table of Content

i.	Organizing Committee	i
ii.	Theme of the Seminar and the Subthemes	ii
iii.	Introduction	iii-iv
iv.	Lecture Series	
	Lecture-1: Professor Rajat Acharyaa	v-vi
	Lecture-2: Professor Ranajay Bhattacharya	vii-viii
	Special Article: Professor Debasish Majumdar	ix-xv
	Article: Dr. Bipul De	xvi-xvii
v.	Contribution of Participants	
	“The Interplay of Political and Economical Perspectives in Shaping Global Climate Change Policy” <i>Souravi Bardhan, Moumit Roy Goswami</i>	1-31
	“FDI In Multi-Brand Retail Policy in India: Inputs and Responses” <i>Paromita Chakraborty</i>	32-44
	“Trade Opnness and Economic Growth of Sri Lanka from 2000 To 2021” <i>Debjani Mitra, Mrittika Sarkar</i>	45-59
	“Politics of Economy : Escalation of The Global Climate Change” <i>Sneha Roy</i>	60-78
	“Navigating The Economic Slowdown: India’s Response and Competitive Edge In The Global Market” <i>Debanjana Das, Srijita Bhattacharjee, Diptadeep Dhar, Mayukh Kundu</i>	79-96
	“Spllover Effects of Pandemic–Comparative Study of India and China at a Glance” <i>Ananya Chatterjee, Bhaswati Pal, Sneha Ari</i>	97-103
vi.	Report of the National Seminar	104-105
vii.	Feedback from Participants	106-108
viii.	Recommendations	109-110
ix.	Photo Galary	111-112

Organizing Committee

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Theme and Subthemes

The Government of India has started an initiative named “Azadi Ka Amrit Mahotsav” to celebrate and commemorate 75 years of progressive independent India and the glorious history of its people, culture and achievements. One of the themes planned by the Government to celebrate the ‘Azadi Ka Amrit Mahotsav’ is Achievements@75 within which two important sub-themes are “Environment@75” and Economy@75. Keeping these subthemes of “Azadi Ka Amrit Mahotsav” in mind we have chosen the following areas as subthemes of the seminar:

1. Economy, Politics and Climate Change;
2. Global Supply Chains: Trade and Economic Policies for Developing Countries;
3. Global Economic Volatilities and Impact on National Economies;
4. Export-led Growth and Sustainability;
5. Economic Slowdown;
6. Geopolitical Impacts on International Economies;
7. Crude Oil Market and Cost Driven Inflation;
8. Services, Investment and Digital Trade;
9. Trade, Investment and Public Health;
10. Trade Finance and Block Chain.

Introduction

India has completed seventy five years of its independence and over the past 75 years it has achieved in various sectors such as agriculture, trade, science and technology. The Government has taken an initiative to celebrate the ‘**Azadi Ka Amrit Mahotsav**’ which will not only highlight these achievements and thus boost the citizens / society to confront and overcome challenges and achieve further but also to build ‘**Atmanirbhar Bharat**’ keeping in mind the goal of sustainable development. As academicians we believe that it is high time to assess how much India has achieved economically under the theme **Economy@75** at the cost of environmental resources under the theme “**Achievements@75**” of the ‘**Azadi Ka Amrit Mahotsav**’.

Since 1991 India is abolishing its trade barriers continuously as part of its Globalization policy. Increasing population, economic growth, expanding trade relation thus generating continuous pressure on environmental resources resulting in pollution abatement a main issue of disagreement among the trading partners. The disagreement is even more as now a day’s production of most manufacturing goods is spread out in different parts of the world called as Global Value Chain or the Global Supply Chain. As the environmental degradation due to climate change is an existential threat to people’s lives and is dramatically reshaping economic activity and trade it calls for collective solutions, multilateral cooperation and coherent action even more in global value chains in line with the international community's wider ambitions for economic growth and sustainable development. *The World Trade Report 2022: Climate Change and International Trade* reviews the role of trade, trade policy and international trade cooperation in addressing climate change. It discusses how changing temperature and weather and the low-carbon transition required to contain rising greenhouse gas emissions are likely to impact their comparative advantages and ultimately the welfare of country’s population.

Exports from one country to another often involve complex interactions among a variety of domestic and foreign suppliers. Even more than before, trade is determined by strategic decisions of firms to outsource, invest, and carry out activities wherever the necessary skills and materials are available at competitive cost and quality. In reality, about 70% of international trade today involves global value chains, as services, raw materials, parts, and components cross borders, often numerous times. The fundamental problem of global value chains is to attribute the production of a good to a particular country. Hence there is also a growing discussion about whether there is a need to update or clarify existing trade rules and commitments.

Rapid technological changes, increasing digitalisation, growing importance of Global Value Chains, Blockchain’s potentiality in trade related applications are the few of several areas where there are immense opportunities to increase the scale, scope and speed of trade for India. Rapid technological developments facilitate the rise of services in international cross-border trade. Information and communication technology services form the backbone of digital trade, providing the necessary network infrastructure and underpinning the digitisation of other types of services that are supported by a range of new services building on data-driven innovative solutions such as cloud computing. In recent times, Blockchain has been greeted by many as the next big game-changer. Blockchain’s potential trade-related

applications are numerous and could significantly transform international trade. Blockchain encompasses a diverse set of areas from finance, including trade finance, to customs and certification processes, transportation and logistics, insurance, distribution, intellectual property (IP) and government procurement. Though the technology opens interesting opportunities to enhance the efficiency of a number of processes and cut costs in these areas, carefully weighing the costs and benefits is essential.

So Vidyasagar Metropolitan College and Netaji Nagar College for Women have jointly organized the one day National Level Seminar titled **“75th year of independence: The Challenges and Opportunities before India in Contemporary Global Trade Scenario”** in expectation that the scholarly discussion on the seminar would prescribe some policies and throw some light on the possible outcomes of trade policies on society’s welfare. We were fortunate enough to have with us two eminent teachers and distinguished professors, Prof. Dr. Rajat Acharyya, Department of Economics, Jadavpur University and Prof. Dr. Ranajay Bhattacharya, Head of the Economic Division, Indian Institute of Foreign Trade, Kolkata as our Invited Speakers. We are extremely thankful to Dr. Debashis Mazumdar, Professor of Economics, The Heritage College, for accepting our invitation to act as chairperson in the paper presentation session of this national seminar with his eminence in the field of Economics.

We feel honoured that several scholarly papers have also been submitted by learned teachers, scholars and students of different colleges and universities for presentation on the theme and subthemes of the seminar. We are thankful to ICSSR-ERC for supporting us in all possible ways to arrange the seminar in an organized manner.

Dr. Suparna Nandy (Pal)
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Trade and the Environment

Rajat Acharyya*

There are two way causations between international trade and the environment: Lax environmental regulation may lead to “perverse” comparative advantage through under-valuation of the environment, on the one hand; and larger trade shifts pollution load from one country to the other, on the other hand. Regarding the former causation, the bone of contention is that the developing countries deliberately keep environmental standards low to give their firms producing dirty goods an unfair cost-advantage and allow them to practice ecological dumping. In case of the reverse causation, however, the direction of shifting of pollution load depends on whether production or consumption pollution is under consideration. Evidence regarding environmental impacts of Indian trade is mixed. Using the input-output method, and considering three pollutants (CO₂, SO₂ and NO_x), Mukhopadhyay and Chakraborty (2006) show that liberalization of trade policy in India has not been associated with pollution intensive industrial development. At the same time, findings of Gamper-Rabindran and Jha (2004) indicate that exports and FDI grew in the more polluting sectors relative to the less polluting sectors in the post-liberalization period. In fact, the top export products of India still comprise of petroleum products, agricultural products, textiles and yarns, and chemicals. Production of these export goods have been contributing to pollution emissions quite substantially. Petroleum refineries are a major source of hazardous and toxic air pollutants such as particulate matter (PM). Mining for gold, silver and diamonds result in water pollution, Green House Gas emission, and soil erosion. In a recent study, on the other hand, Marjit and Yu (2018) show that GDP has a direct, proportional relationship with the extent of CO₂ emissions in India, and the relationship is even stronger after the liberalization policy in the 1990s.

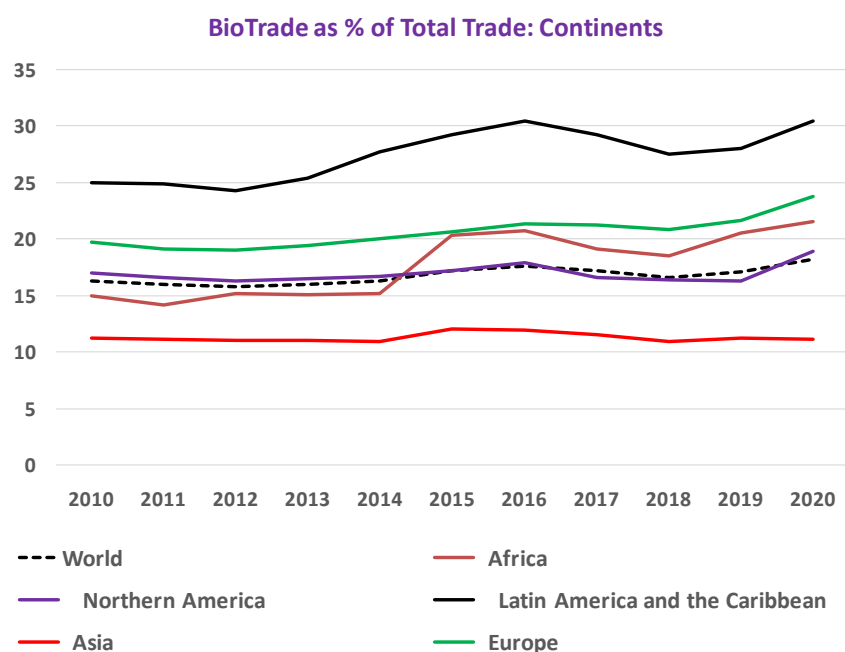
Trade, Carbon Emissions and Climate Change: Evidences

The World Bank Report 2021 on Trade and Climate Change shows that in the last decade, some developing countries like China and India have emerged as fast-growing emitters of greenhouse gases. China, the European Union, India, Japan, the Russian Federation, and the United States accounted for about 70 percent of global emissions in 2019. The poorest countries, however, remain the smallest contributors to emissions. Yet they often suffer the most from climate change. Natural disasters disproportionately affect the most vulnerable people and the smallest firms. Agriculture and tourism are the glaring examples. Thus, despite not being any significant contributors to CO₂ emissions, the poorest countries are already facing the most adverse consequences, which impede their growth and development.

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Bio Trade

BioTrade is trading of a product or service sourced from biodiversity in a way that respects people and nature. The conservation of biodiversity, and the sustainable use and trade of biodiversity-derived products can provide countries valuable opportunities for economic development and improvement of livelihoods. To capture this opportunity, in 1996 UNCTAD launched the BioTrade Initiative to support the objectives of the Convention on Biological Diversity



Source: Author's Calculation using UNCTAD data

Policies and Regulations

There is a wide range of policies adopted by countries to tackle some of these issues. These include, Pigouvian Taxes such as carbon tax and pollution-content tariffs; Standards, such as minimum environmental standards, ISO 14000 standards, carbon footprints of imports; and Tradable Permits.

Goods from "Everywhere," Rather Than "Somewhere": The Global Value Chain and the Problem of Rules of Origin

Ranajoy Bhattacharyya

Classical trade theory predicts that a country will specialize in the production of a set of commodities in which it has a comparative advantage. It will then export this set of commodities to the rest of the world and import other commodities from them. This view of world trade is no longer true for a large set of commodities that are traded. These days the production of most manufacturing goods is spread out in different parts of the world. For example, the wingtips for the Boeing Dreamliner aircraft are built in Busan in South Korea, the landing gear for the same aircraft in Gloucester in the UK, and its horizontal stabilizer in Foggia, Italy. Parts of the aircraft are also produced in Japan, Canada, Australia, France, and Sweden. Since the plane is finally assembled in the United States of America, all these parts have to be imported from all these countries by the US. The final plane then is exported back to all these countries. This type of production arrangement, where parts of goods are produced in several countries is called the Global Value Chain (GVC) or the Global Supply Chain.

One of the fundamental problems of GVCs is to attribute the production of a good to a particular country. Is Boeing's Dreamliner plane produced in the US? The answer is no. Then where is it produced? Which country's product is this? These questions have no easy answer. However, they are extremely important questions that need an urgent answer if you are dealing with trade policies. Take for example the case of Free Trade Agreements (FTAs). In these agreements, countries decide to lower or eliminate customs duties on goods traded among them. Say, for example, if India has an FTA with Malaysia then all goods produced in India can be imported by Malaysia at a concessional/no customs duty and vice versa. But how to determine whether a good is produced in India or Malaysia? Raw materials and parts of many goods that India exports come from other countries. The same happens in Malaysia. Will these goods be eligible for concessional duty under the FTA? What percentage of the total value of the good has to be produced in India for it to be branded as "Indian" and hence eligible for concessions or duty exemptions under FTAs?

Every FTA or Preferential Trade Agreement (PTA) has a set of rules that define the "origin" of the product. These rules are called the Rules of Origin (ROO). These rules ensure that a product, for instance, produced mainly in China and merely assembled in the US does not get the benefit of an FTA that the US signs with another country.

There are several theoretical implications of this type of rule on trade policy. First, in a world characterized by GVCs things are not so clear-cut: tariffs and other protection measures at the border are cumulative when intermediate inputs are traded across borders multiple times. Tariffs and non-tariff measures can add a significant cost to the price of the finished good that in turn affects the

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production and investment decisions of firms involved in GVCs. Nominal duties on gross exports are an incomplete measure of effective tariff barriers. The effective burden for the exporter is better measured by tariffs on the domestic value added of exports, which are particularly high in those economies that have a large share of intermediate imports in their exports. Second, success in international markets today depends as much on the capacity to import world-class inputs as on the capacity to export. Protection measures against imports of intermediate products increase costs of production and reduce a country's ability to compete in export markets: tariffs and other barriers on imports are a tax on exports. Third, it increases trade costs. As goods now cross borders many times, first as inputs and then as final products, fast and efficient customs, and port procedures are essential to the smooth operation of supply chains. To compete globally, firms need to maintain lean inventories and still respond quickly to demand, which is not possible when their intermediate inputs suffer unpredictable delays at the border. Added to this is the cost of information, coordination, and traceability. Thus the fundamental drivers of trade have shifted from technological or endowment advantages to issues of port efficiency, customs efficiency, and, in general, ease of doing business in countries.

Governments all around the world are struggling to regulate trade in this era of production fragmentation and global value chains. The implications of these regulations on using trade policy to maximize domestic welfare are also changing. This changing nature of trade from "somewhere to somewhere" to "everywhere to somewhere" or even, as in some cases, to "everywhere to everywhere" is thus a grave new challenge that trade theorists as well as policymakers urgently grapple with.

From Globalization to Deglobalization?

Debashis Mazumdar*

1. Introduction

Globalization can be considered to be a process of closer integration of countries and peoples of the world which has been brought about by the enormous reduction of costs of transportation and communication. It also implies the breaking down of artificial barriers to the flows of goods, services, capital, knowledge and to some extent the people across borders. The process of Globalization has helped in developing a strong and complex global supply chain no doubt. However, a closer view of the trade openness index can reveal a trend of deglobalization since 2006-07. This paper is a modest attempt to identify that process.

2. Globalization: some strong points

Globalization has been accompanied by the creation of new institutions which have joined with the existing ones to work across borders (For instance the Jubilee movement in coordination with the Red Cross Society aimed at reducing the debt burden of the poorer countries by the year 2000). This process has also been powerfully driven by international corporations (MNCs) which are instrumental in the movement of not only capital and commodities but also technology across nations. This process has also led to renewed attention to long-established inter-governmental institutions, viz. ILO (that promotes the agenda for a decent work), WHO (which is especially concerned with improving health conditions in developing countries). All these aspects of globalization have been welcomed everywhere.

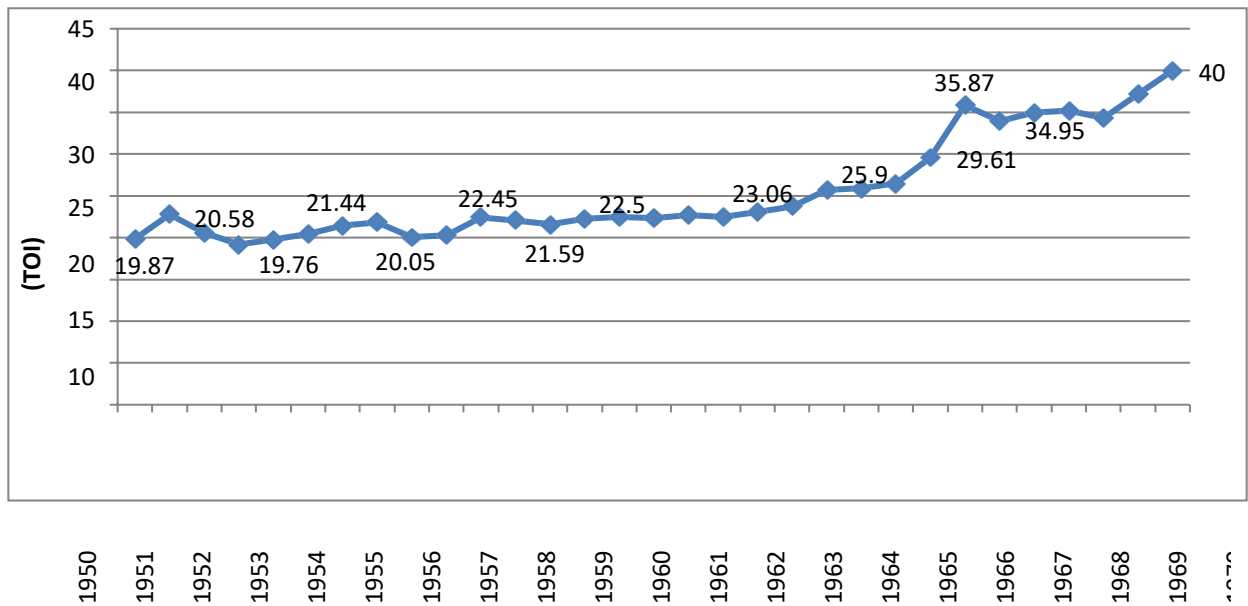
Globalization has had some successes, particularly in East Asia, where incomes increased in the 1960s, 1970s, and 1980s. Countries such as Korea increased their per capita incomes eight-fold, almost eliminated poverty, achieved universal literacy, improved health standards, and increased their life expectancy.

3. The Progress of globalization: Trade Openness Index

The Progress of globalization in the world economy is often shown by the Trade Openness Index (TOI) where $TOI = (\text{Global Exports} + \text{Global Imports}) / \text{Global GDP}$. Fig.-1(a) shows that the process of globalization was comparatively slow during 1951-1980. The value increased from 19.87 in 1950 to only 23.06 in 1968. It gained some momentum since 1972-73 when several countries started relaxing the restrictions of foreign trade.

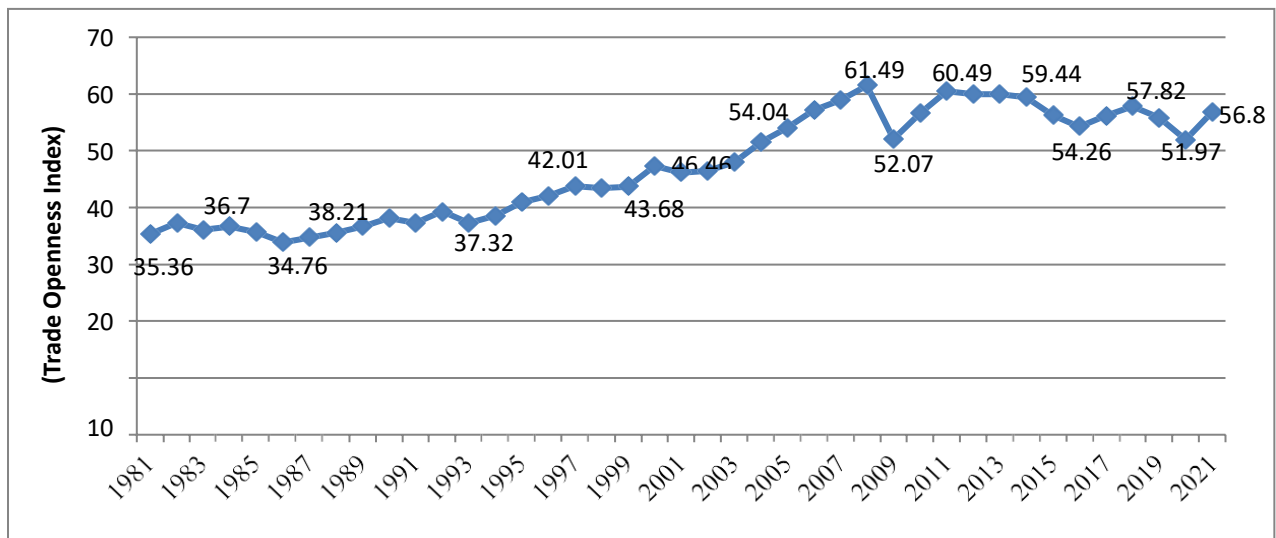
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Fig.-1(a): Movement of Global Trade Openness Index during 1950-1980



Source: Our World in Trade (website: ourworldindata.org)

Fig.-1(b) Movement of Global Trade Openness Index during 1981-2021



Source: Our World in Trade (website: ourworldindata.org)

However, the process of globalization, as measured by the TOI, gained its pace particularly since 1995 when it crossed the 40% mark in terms of TOI [Fig.-1(b)]. The TOI reached upto 61.49 in 2007-08. However, the financial crisis in US and Europe led to a sudden downfall in TOI from 61.49 in 2007-08 to 52.07 in 2009-10. Though there was a recovery from that drop, the pace of global trade indicated a declining trend since 2011-12.

The process of globalization during the last few decades has also been shaped by the operations of three main international institutions, viz. International Monetary Fund (IMF), World Bank and the World Trade.

Organization (WTO). Since 1980s, IMF, World Bank and the US Treasury have been following a neo- liberal economic reform policy particularly for developing nations, commonly called as **Washington Consensus**.

This reform package also shaped the process of globalization and it included:

- a) Fiscal discipline,
- b) Tax reforms (through the broadening of Tax-base and cutting marginal tax rates),
- c) Market determined interest rates,
- d) Trade liberalisation (through the replacement of quantitative restriction by low and uniform tariff rates),
- e) Openness to foreign direct investment,
- f) Privatisation of state enterprises,
- g) Deregulation, i.e., abolition of government regulations that restrict competition, etc.

4. Washington Consensus: some disturbing impacts

Many of the ideas incorporated in ‘Washington Consensus’ were developed in response to the problems in Latin America where governments had let budgets get out of control while loose monetary policies had led to rampant inflation. However, the solutions provided by the IMF or World Bank to several developing countries failed to provide any long-term solution to the crises faced by them. As a part of the conditionalities imposed upon the developing countries, they had to follow austerity in government expenditure, liberalize the policy regime with greater emphasis on privatization. These conditionalities forced the developing countries to open themselves to several imported products which would compete with the domestic import competing industries leading to disastrous consequences.

One of the so-called advantages of the Uruguay Round of GATT was the extension of liberalization to trade in services. Seeking an agreement on services was a timely decision. Manufactured goods, the focal point of discussions on trade for about five decades, had dwindled as a share of the American economy and this has been overtaken by services. In 2021, for instance, only 14 percent of the American labor force worked in manufacturing sector. But the services that featured on the WTO agenda were financial services, viz., those services in which US had a comparative advantage. Services such as maritime or construction services that are intensive in unskilled labor were not on the agenda. In fact, the US government remained extremely protectionist in those areas.

At several WTO meetings it became clear that in trade, the developed countries continued to demonstrate their myopic and short-term approach to globalization. While these rich countries have been enthusiastic sellers of free trade to developing countries, they themselves have failed to practice what they preach.

Though agriculture accounted for more than 70 per cent of employment in low-income

countries, the OECD countries continued to provide their farmers more than US\$300 billion as agricultural subsidies each year. As a result, the farmers from the United States and European Union could export some crops at prices much lower than the cost of production. Even the subsidies provided to US cotton growers are found to be more than triple the amount of US government aid to sub-Saharan Africa, depressing world cotton prices and presenting a serious threat to the livelihoods of the poor. The cash subsidy to every dairy cow in European Union (EU) exceeds total per capita EU aid to sub-Saharan Africa. In areas such as textiles, clothing, shoes, and processed agricultural products, developing countries continue to be barred from the markets of rich countries by high tariffs. All these aspects have inhibited the process of globalization.

Joseph Stiglitz is of the opinion that the globalization process since 1980s has been showing the existence of a global governance where a few institutions like IMF, World Bank, WTO etc. dominate but we do not have global government, accountable to the people of every country, to oversee the globalization process in a fashion comparable to the way national governments guided the nationalization process. Thus, one of the problems with the ongoing process of globalization is that economic globalization has outpaced political globalization.

5. Deglobalisation: Possible reasons

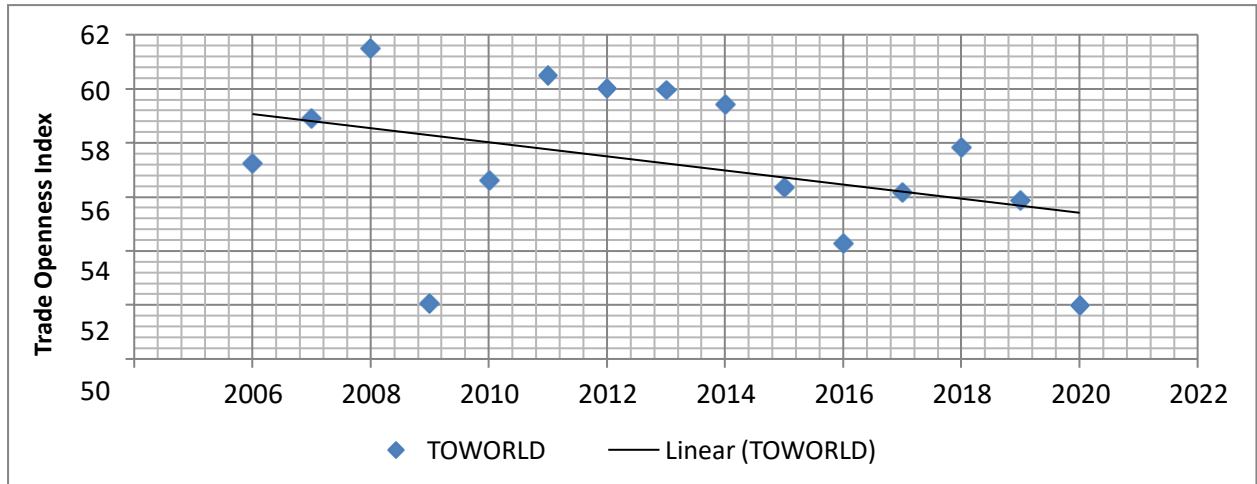
It has been observed that the approach towards globalization as followed by the US government was based on unilateralism rather than multilateralism. They seized the opportunity to open up new markets for the advanced industrial countries and they used the US government to advance their interests. Supported by Europe to some extent, the US used its economic and military supremacy to create a set of policies that were grossly unfair particularly in the area of trade, and particularly to the developing countries. This unilateral policy was carried forward by global economic institutions that are fundamentally undemocratic and non-transparent. At the IMF, for instance, only one country, the US, has veto power. The US used the threat of its veto to shape the stance of the IMF on economic policy.

Under President Donald Trump, the United States has embraced an “America First” policy, shifting away from trade liberalization (withdrawing from the Trans-Pacific Partnership) and moving toward protectionism. The Trump administration imposed tariffs on imports of steel and aluminum ostensibly on grounds of national security, prompting retaliation and the spread of trade barriers elsewhere.

The United States also initiated a trade war with China over its unfair trade practices, significantly reducing bilateral trade between US and China. The strategy of US in this regard was supposed to rip off the supply chains and make the United States less dependent on China. This “decoupling” between the world’s two largest economies has also affected the process of globalization. Thus, the growth of global value chains, viz. the spread of supply networks across countries, has flattened in the recent past. The reform agenda has stalled around the world. For instance, under President Xi Jinping, China began to follow inward looking policies to promote the indigenous development of their leading industries. Thus, we find that the Trade Openness Index (TOI) has shown a declining trend during 2006-

23 [Fig.-2]. This feature is called as deglobalization. Some economists consider this phase as ‘Slow Globalization’ or ‘Slowbalization’. Of late, the COVID-19 pandemic simply adds further momentum to the deglobalization trend.

Fig.-2 Deglobalization Trend during 2006-20



Source: Our World in Trade (website: ourworldindata.org) [Author’s Compilation]

Experience also suggests that fear leads countries to turn inward. Many countries are now rethinking tradedependence. Phil Hogan, the European Union’s commissioner for trade, has stated, “we need to think about how to ensure the EU’s strategic autonomy.” Scott Morrison, Australia’s prime minister, told parliament: “Open trading has been a core part of our prosperity over centuries. But equally, we need to look carefully at our domestic economic sovereignty as well.” Japan has also begun investigating how to break its supply-chain dependence on China and produce more at home.

6. Conclusion: Making globalisation fair

We have already seen many defects of the present process of economic globalisation. Now, the question is how this process of globalisation can be made more ‘fair’? Different economists have indicated that ‘we do not deny this process but it should be a fair game’. The steps that should be taken to make this process more ‘fair’, are as follows:

- (1) **Positive role of the government:** The government of the host country should play a positive role in protecting the interests of economically backward or poor people. Adequate welfare measures should be taken to provide them with adequate food, shelter and education at an acceptable price. The government should also frame proper rules to safeguard the interests of workers working in small-scale firms or in the affiliates of MNCs. The government should also frame rules to check unfair competition in many industries (e.g., the government of India has enacted Competition Act, in the year 2000 to tackle this problem).

While analyzing the reasons for the failure of many African countries to exploit the good effects of globalization, a social scientist, viz. Paul Collier who is the Professor of Economics and Director of the Centre for the Study of African Economies at

Oxford University, has opined that globalization tends to accentuate a country's comparative advantage. However, for several countries of Africa, domestic policies and institutions have ruled out manufactured exports, leaving exports dependent upon natural resource extraction with its attendant problems.

Further, the internationalization of crime has made Africa's weak governance commercially valuable, creating powerful lobbies for the further erosion of the rule of law.

The mismanagement of rents arising out of natural resources has been one of the core syndromes in failing states in Africa. It is therefore entirely appropriate that both international civil society—such as the NGO, Global Witness (Global Witness is an international NGO established in 1993 that works to break the links between natural resource exploitation, conflict, poverty) — and OECD governments through the Extractive Industries Transparency Initiative—should adopt this as a priority concern of their development assistance.

- (2) **Adequate vigilance over the markets where foreign firms have entered:** Though foreign firms are allowed to enter in various markets of the host country (say, in the capital market, banking and insurance market, etc.), the authorities must be vigilant against any unfair trade practices. For example, the regulatory bodies like Securities and Exchange Board of India (SEBI), Insurance Regulatory and Development Authority (IRDA), etc. in India should frame proper rules and regulations to check unfair trade practices in the Indian capital and insurance markets.
- (3) **Proper Negotiations with the WTO:** The less developed and developing countries should be united to raise their voice against the unfair trade practices of many developed countries before the WTO. The WTO has also the responsibility to make those developed countries follow the agreements or negotiations so that the developing nations get proper market access in developed countries. Hence, we need such a globalisation process where every country gets its fair share and income inequalities between nations are reduced to a large extent.
- (4) **Achieve Millennium Development Goals (MDG) with a collaborative effort:** The MDG provides a measurable set of human development benchmarks. Through annual reporting these are not just becoming a scorecard on national performance, but are also providing clear indications of whether the world is managing to build the more “inclusive and equitable” globalization called for in the Millennium Declaration.

Ultimately, to achieve the fundamental vision of the Millennium Development Goals as a means of better managing globalization on behalf of the poor, the relevant goals need to be seen as an indivisible package. This is a package that holds unprecedented promise for crafting a globalization built around the interests of the many, not the few. And it represents a promise every country in the world has already pledged to keep.

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Russia -Ukraine Conflict and the Growth-Inflation Mix for India

Bipul De*

Russian President Vladimir Putin announced a special military action in eastern Ukraine on February 24, 2022. The war triggered a massive shock to the global economy, especially to energy and food markets, squeezing supply and pushing up prices to unprecedented levels, thereby disrupting the entire supply chain. The war impeded the flow of goods, fuelled cost increases and product shortages, and created massive food shortages around the globe. Grain exports out of Ukraine dropped significantly.

The Indian market then crashed by 4.7 %, the rupee against the US dollar dropped to a low of 75.75 due to the outflow of funds owing to the geopolitical uncertainties.

India imports a significant amount of precious stones, mineral oil (world's third largest consumer of oil), nuclear reactors and fertilizers from Russia. So trade was effected with a cascading impact on the Indian economy. As of December 2021, India's exports to Russia stood at Rs. 27.114 billion which was the highest export trade amount in the last thirty years (Source: RBI bulletin, June 2022 to December 2022). But as the news of war hit the public domain then the Indian rupee continued to depreciate.

- It helps the exporters as they earn more money for goods exported (in the short run) but it holds true only for those who do not import any raw material for production. A stable exchange rate allows a company to plan better and to estimate more accurately the demand and supply of goods and services. Since a stable currency exchange rate is always preferable for business, therefore for the exporters this stability was a better option to the exporters than the benefit accrued from depreciated rupee.
- It pushed up our import bill for both energy & fertilisers and the rising prices of wheat globally. These have contributed to raising the interest rates by the Indian policymakers in tandem with the rise in global interest rates. It causes higher inflation and lower growth for India.
- A rising import bill coupled with supply side disruptions causes the consumer price inflation at 6.7, as a result RBI hikes the repo rate at 6.25 percent.

The conflict worsened the Indian growth with higher inflation. It pushed up the crude prices and caused supply side bottlenecks, thereby pushing significant upward pressure on inflation. It also raised the fertiliser bill substantially and threatened to derail the budgetary math (Dharmakriti Joshi, Chief Economist, Crisil)

- Indian crude basket rose rapidly from \$80 in 2022-23 to \$110 in six months after the war broke out. India's import bill rose 76% in the first six months of this fiscal to \$90.3billion (7,20,403 crore) (source : Ministry of Petroleum and Natural Gas, GoI)
- for fertilisers, the subsidy bill was from 1.1 lakh crore to 2.3-2.4 crore in the last budget (source : Fertilisers Association of India)

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The other side of the story is the sanctions on Russia by the US and its allies. Russia offered deep discounts to India on key commodities. India meets more than 85% of its oil demand via imports which makes it highly vulnerable to price volatility. As a result of discount,

- India's imports from Russia jumped about five times to \$37.31 billion during April-December 2022.
- According to the energy cargo tracker Vortexa, from a market share of less than 1% in India's import basket before the conflict, Russian share of India's import rose to 28%.

The impact of all this made a negative impact for India's balance of payments. Due to the inelastic nature of energy demand and current difficulties in coal imports, any further increase in crude oil prices invariably leads to higher import bills for the country. If the conflict continues, this will worsen the current account deficit more.

For India, one of the major impacts of the war was a slowdown in pace of economic growth. In 2022, India was expected to grow at 6.7 percent, but UNCTAD offered that to 4.6 percent. According to Nomura Research Institute (NRI), a 10% increase in petroleum prices will lower GDP growth by 0.2 percentage points. Even though India's pace of growth is projected to slowdown in the coming financial year, IMF managing director Kristalina Georgieva said India alone will contribute 15% of the global growth in 2023 for fiscal consolidation.

However, the Russia-Ukraine conflict is also creating an unlikely opportunity for selected Indian agriculture exporters, especially in wheat, maize, millet and processed food. Ukraine is one of the world's top wheat exporters (25% share in the global market). A ban on freight from Russia also means more opportunities for Indian exporters of nuts, confectionery, fruits and pulses. The world has been looking for Indian wheat to fill the huge shocks in the supply chains originating from the conflict. As the price of these commodities are reaching new highs, it opens up new markets for Indian farmers and trades.

Volatility is the most likely prospect in the near future. As the country starts to recover from the pandemic-induced economic slowdown, India's public and private sectors will need to work on energy security and inflation. Supply-side shocks, demand variations, the course of the conflict will all impact the future of the Indian economy, while also opening some new doors for opportunity.

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The Interplay of Political and Economical Perspectives in Shaping Global Climate Change Policy

Souravi Bardhan^{1*}, Moumit Roy Goswami¹

Abstract

Climate change has become an existential threat demanding global attention. The consequences of a warming planet are already manifesting in extreme weather events, sea-level rise, biodiversity loss and threats to food security are no longer a distant concern but a daily reality for many. As a result, the intersection of politics and climate change has become an arena of paramount global significance and in the quest to address this crisis, international agreements and politics play a pivotal role. This review paper embarks on a journey through the intricate landscape of climate actions and progress, illuminating the complex interplay of political will, international cooperation, and societal engagement in a comprehensive manner. From the early recognition of climate change as a global concern to the contemporary efforts to limit its impacts, the current paper explores pivotal milestones, national policies, multilateral initiatives, challenges, and prospects, all while emphasizing the critical need for sustained political commitment and enhanced collaboration to secure a sustainable future for generations to come.

Keywords: Climate change, politics, climate governance, international cooperation, national climate policies, economic aspects.

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1. Introduction

Climate change as characterized by the inexorable rise in global temperatures due to human activities stands as an unprecedented threat to the stability and well-being of our planet. In the present world, climate change is one of the most pressing challenges requiring urgent action to combat irreversible environmental change [1-2]. Climate change is currently the greatest threat to the natural ecosystem worldwide and requires immediate attention with scientific justification. The alterations in the global weather arrays are a long-lasting change that is continually deteriorating the ecosystem structures, increasing the likelihood for pathogenic outbreaks, accelerating biodiversity loss since most of their survival is at stake owing to optimum temperature shifting, making the agricultural and food production sectors vulnerable thus challenging the global economy [3]. Its far-reaching consequences extend into almost every facet of life, from environmental sustainability and economic stability to social equity and geopolitical stability. As such, the intricate nexus between politics and climate change has become a central focus in the dialogue surrounding this global crisis [4-5]. Currently, climate change has turned into a mainstream political issue, involving the participation of worldwide policymakers and governments, academics and commentators [6]. The intricate interplay of politics in addressing climate change is rooted in the recognition that the impacts of a warming planet are not confined by national boundaries. In this regard, political actors, including governments, international organizations, and non-governmental organizations (NGOs) are central to climate politics [7]. Governments drive policy decisions, enact legislation, and negotiate international agreements. International organizations like the Intergovernmental Panel on Climate Change (IPCC) provide crucial scientific assessments thereby shaping political agendas. NGOs exert pressure, raise awareness, and hold governments accountable for their climate commitments [8].

The carbon emissions of one nation affect the climate of another and thus the environmental degradation in one region can reverberate globally [9]. Consequently, global cooperation and political consensus have emerged as indispensable tools in mitigating the worst effects of climate change. Nations worldwide are putting their efforts into generating cutting-edge climate policies, and long-term development goals, implementing strict regulations, investigating techniques, and designing innovative strategies to mitigate the impacts of global climate change to ensure global sustenance. Presently, various public discussions, agreements, and international frameworks on the economy and technological innovation for mitigation and adaptation resulted in the development of prospective solutions, such as carbon trading, changes in national policies, dramatic lifestyle changes by focusing more on green technologies, etc [10-11].

Although climate change accelerated post-industrial era, the timeline of climate change recognition is marked by a series of critical events that shifted the global perspective on environmental issues. The Earth Summit in 1992 led to the creation of the United Nations Framework Convention on Climate Change (UNFCCC) [12], setting the stage for international cooperation on climate issues. This was followed by the Kyoto Protocol and the groundbreaking Paris Agreement [13] with each embodying the incremental progress achieved through international negotiations. The recent IPCC report shows that the global average air

temperature near Earth's surface rose $0.74\pm 0.18^{\circ}\text{C}$ [14] and concluded that most of the observed increase in globally averaged temperatures since mid-20th century is caused due to ongoing increase in concentration of anthropogenic greenhouse gases. The paper discusses the various steps taken by the government to curb the ongoing climate change and restrict the rates of carbon emissions to such an extent that the increase in the earth's temperature can be checked within the limit of 2°C . Emphasis is given to the latest developments and research addressing this global issue, exploring the significance of political actions, policies, and international cooperation in mitigating climate change, adapting to its impacts, and advancing a sustainable and resilient future. Moreover, climate governance, policy frameworks, political barriers, and the role of stakeholders in shaping climate action at various levels have also been focussed. By understanding the intersection of politics and climate change, we can foster informed decision-making, accelerate progress, and create a sustainable future for generations to come.

2. Trends in global climate change

The timeline of climate change recognition is marked by a series of critical events that shifted the global perspective on environmental issues. People started to perceive about climate change and greenhouse effects about 20-30 years ago. The greenhouse factor was first assessed and reported by Joseph Fourier [15] who pointed out that the presence of certain gases (greenhouse gases or GHGs) in the atmosphere raises its temperature to maintain the earth's temperature in a favourable regime. After a decade, another scientist Claude Pouillet [16] reported that water vapour and carbon dioxide were responsible for raising the temperature. Since the 1950s, scientists found a link between the generation of human-induced carbon dioxide and climate change and global warming [17]. The exponential increment in the rate of global warming started with widespread industrialization and urbanization (Figure 1a), which not only perturbed the climate system but also proved to be havoc on the entire environment of the world. The escalation of temperatures over the last 120 years has scaled up the rate of evaporation, having a substantial influence on the rate of precipitation. This has resulted in heavy downpours in the northern latitude instead of snow but drier in the lower latitudes in southern Asia, Africa, and the Mediterranean regions, making them more prone to droughts and forest fires [18]. This change is also accelerating the ocean temperature which promotes ice melting and a rise in sea levels up to 25 cm in some places [19]. Moreover, the partial dissolution of CO_2 in the ocean is promoting ocean acidification. This has hampered the enzyme activity and metabolism of various aquatic organisms, eventually resulting in their death, a species range shift, and higher chances of coral bleaching [20]. Furthermore, the rise in infectious diseases due to climate factors has increased the medical costs of the nations. Changes in the climate have also impacted agricultural productivity, hindering the economic development of a nation.

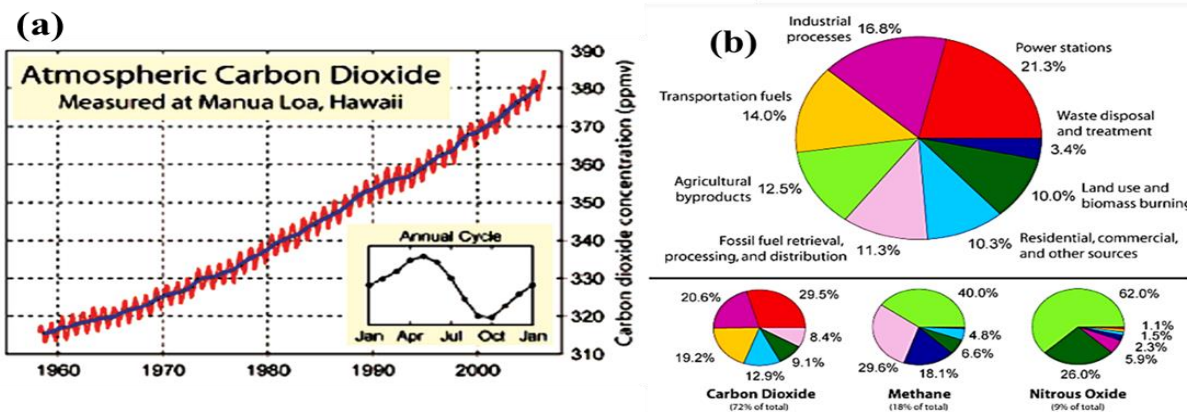


Figure 1: (a) Trend of increase in the earth's temperature with the rise in carbon dioxide emission. Source, IPCC Report 2007; (b) Annual greenhouse gas emission by various sectors [21].

Climate change is not a static phenomenon and the urgency of political actions is due to the following impacts on the global environment:

2.1 Global Temperature Rise: One of the most evident trends is the global temperature rise. Over the last century, the Earth's average surface temperature has increased by approximately 1.2 °C (2.2 °F) [22]. This trend of warming of the atmosphere is attributed primarily to the release of various greenhouse gases in the atmosphere requires immediate attention from the political sectors. Several international agreements have come up with a global collective goal of setting the rising temperature within a particular limit at a stipulated period of time. The recent international agreement in Paris suggested adopting measures to limit the temperature rise within 1.5 °C, which was earlier considered to be 2 °C [23]. It is evident that even a 0.5 °C additional rise can increase the drought risks in Mediterranean areas and central Europe may result in an 18-41% reduction in global precipitation, and adversely affect the agricultural, hydrological, and health-related sectors. Moreover, if there is a nearly 2 °C rise in the global mean temperature, the coral reefs which form a prominent part of coastal ecosystems will be at substantially higher risk [24]. Hence, multi-level decision-making processes and sound scientific analysis of the techniques to limit warming to 1.5 degrees is now the greatest challenge.

2.2 Extreme Weather Events: Another striking trend is the increasing frequency and severity of extreme weather events. Heatwaves, hurricanes, droughts, and heavy rainfall events are becoming more common and intense, causing devastating economic and social impacts [25]. These events are not only a consequence of a warming planet but also serve as powerful reminders of the urgent need for climate mitigation, strict regulation and policies, and adaptation measures.

2.3 Melting Polar Ice and Glaciers: The melting of polar ice caps and glaciers is a visual manifestation of global warming. Both the Arctic and Antarctic regions have witnessed rapid ice loss contributing to rising sea levels. The consequences of this trend are profound, as it poses significant threats to coastal communities, biodiversity and global ecosystems [26]. The

polar fauna populations, such as polar bears, seals and walruses have been rapidly decreasing mostly due to receding sea ice.

2.4 Sea-Level Rise: Rising sea levels are a direct consequence of global warming and the melting of ice caps and glaciers. This trend has serious implications for coastal regions, where millions of people reside. Increased sea levels exacerbate the impact of storm surges, leading to coastal erosion and flooding, which in turn trigger economic and social challenges. Other than frequent flooding, it has been predicted that some island nations will submerge and disappear within a few decades. A report by Yin, 2009 [27] suggested an average increase of 1.7 mL per year between 1870 and 2000 (an estimated total of around 221 mL) and now it is showing an accelerated rise (about 48 mL between 1993 and 2009). Governments and scientists are apprehensive that various communities residing at the shore of Kuakata and Saint Martin's Island of Bangladesh or on the coastline of Colombia are under huge threat [28-29]. Even several islands and atolls in the South Pacific and Indian Oceans, like Maldives, French Polynesia, and Marshall Islands will face a similar fate and may submerge or simply disappear in the near future under the rising seas and heightened storm surges [30]. Moreover, the rich diversity of flora and fauna in such places is also facing loss due to the permanent inundation of lands. Moreover, such land and biodiversity losses owing to the rise in sea level have a deleterious effect on the nation's socio-economic status.

2.5 Ocean Acidification: The world's oceans absorb a substantial portion of atmospheric CO₂, leading to a phenomenon known as ocean acidification. Basically, due to anthropogenic carbon uptake by ocean water lowers water pH and causes a saturation state of biogenic CaCO₃ minerals (calcite, aragonite) [31]. This process negatively impacts marine ecosystems, including coral reefs and shellfish populations. Increasing acidification even causes habitat degradation, macroalgal dominance shift, and risks to biodiversity residing mainly in the tropical, sub-tropical, and temperate coasts. The long-term consequences of ocean acidification are still being studied, however the potential ecological and economic ramifications are concerning.

2.6 Shifts in Weather Patterns: Climate change has also led to shifts in weather patterns, altering precipitation distribution and creating regional disparities. Some regions experience more prolonged droughts while others face increased rainfall and flooding. These shifts disrupt agricultural practices, threaten food security, and can lead to social and political instability [32]. This not only poses havoc to the agricultural sectors and food productivity but also results in huge economic losses every year.

2.7 Biodiversity Loss: Climate change is a significant driver of biodiversity loss. As ecosystems and habitats change due to altered temperature and precipitation patterns, many species struggle to adapt or migrate. This has led to species extinction and imbalances in ecosystems with cascading effects on food chains and human well-being. Most of the species strive due to alteration in optimum temperature. This has a huge impact not only on the productivity field but also negatively affects the ecotourism. One of the most vulnerable species is the coral reef [33]. Marine heat waves caused by global warming are continually degrading coral reefs worldwide. The coral bleaching phenomenon is closely associated with the alteration of the microenvironment, disruption in biogeochemical services, and minute changes

in the physical characteristics of the water. Moreover, a recent study by Johnson et al. (2023) [34] suggested that mangrove-associated corals can withstand bleach under thermal stress owing to reduced calcification. On the other hand, there is a rapid reduction in the mangrove forest cover. Hence, the intervention of political sectors is of utmost significance to combat the ongoing issues.

2.8 Rising Methane Emissions: Alongside CO₂, methane (CH₄) is another potent GHG contributing to climate change. Methane emissions from livestock, agriculture and fossil fuel extraction have been on the rise [35]. Reducing methane emissions is a crucial part of mitigating climate change highlighting the importance of political actions in regulating and incentivizing emissions reductions.

These trends underscore the urgent need for political action to combat climate change. While the scientific consensus on the reality of climate change and its human origins is overwhelming, the politics surrounding climate change remains complex and multifaceted.

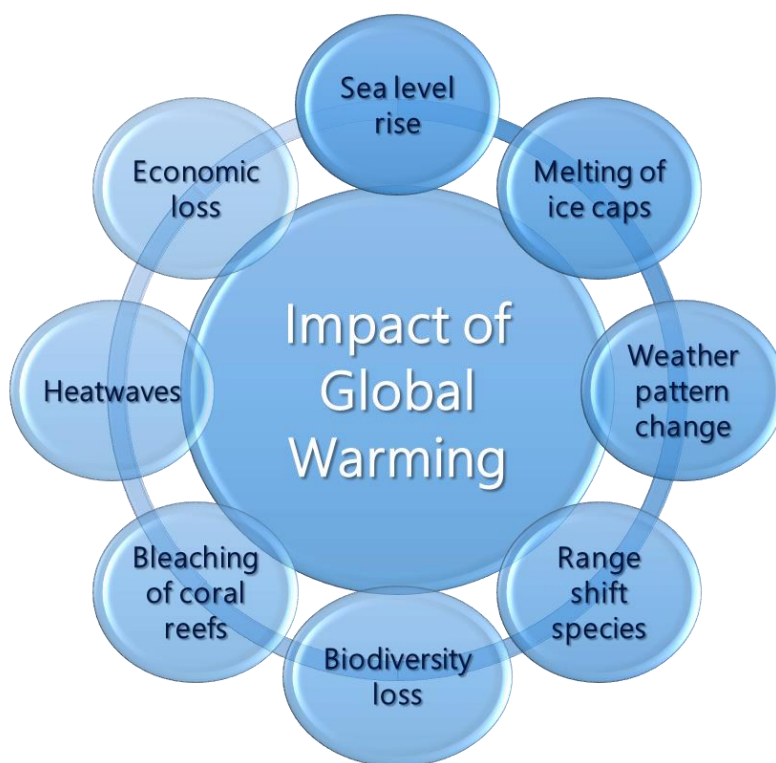


Figure 2: Impact of climate change on the environment

3. The Political Landscape

3.1 Climate Governance and International Cooperation

3.1.1 The Birth of International Climate Agreements

The urgency of addressing climate change became increasingly evident in the latter half of the 20th century. The world witnessed a series of extreme weather events, glacial melt and the relentless rise of global temperatures. Recognizing the necessity for global cooperation to combat this existential threat, the international community embarked on a journey that led to the origin of international climate agreements. Thus, the foundations of international climate

agreements were laid upon the recognition of a looming crisis. Scientists have long observed the connection between the burning of fossil fuels, deforestation and the accumulation of greenhouse gases (GHGs) in the atmosphere. The study of researchers like Charles David Keeling, who established the Keeling Curve to monitor rising CO₂ levels provided irrefutable evidence of human-induced climate change [36].

In response to the various concerns associated with climate change, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) in late 1988 to produce sufficient momentum in formal negotiations, solidifying the scientific consensus on climate change for understanding the consequences of a warming planet and to endorse working groups to achieve the targets and to mitigate its impacts [37]. The turning point came in 1992 at the Earth Summit in Rio de Janeiro, Brazil. A comprehensive framework was constructed in the United Nations Conference on Environment and Development (UNCED) held in June 1992 in Rio de Janeiro, where concerned delegates and governments from various nations participated. As an outcome of the conference, the United Nations Framework Convention on Climate Change (UNFCCC), a treaty that acknowledged the reality of climate change and its potential for severe social, economic, and environmental consequences was established to stabilize the greenhouse gas concentrations in the atmosphere [38]. This landmark treaty acknowledged the scientific consensus that climate change is occurring and poses a significant threat to the global community. It was the first treaty to gain global recognition with 197 parties, including the European Union. This recognition demonstrated the global acknowledgment of climate change as a shared challenge. UNFCCC also addressed Common but Differentiated Responsibilities (CBDR), which acknowledged that while all nations must address climate change, developed countries that historically emitted the most GHGs should take the lead in mitigation efforts [39]. It recognized that addressing this challenge required collective action, transcending national borders and political ideologies. While the UNFCCC laid the foundation for international climate action, it had limitations. It lacked legally binding emission reduction targets, and its voluntary approach relied on countries setting their own goals. Consequently, it became clear that a more stringent and actionable agreement was needed to tackle the climate crisis effectively. Since carbon dioxide is the predominant contributor to the projected radiative change from the combustion of fossil fuels and from deforestation, various conferences followed to tackle global carbon emissions.

3.1.2 Kyoto Protocol: A Milestone

The greatest concern regarding the rapid melting of ice caps and the continuing retreat of glaciers, the Kyoto Protocol took place in 1997 to curb anthropogenic interference with the climate system. The need for legally binding targets led to the Kyoto Protocol which marked a significant milestone in setting legal restrictions and emission reduction targets for developed countries. Building on the UNFCCC, this protocol set binding emission reduction targets for developed countries known as Annex I parties, with the aim of reducing their emissions by an average of 5.2 % below 1990 levels by the first commitment period (2008-2012) [40]. The nations signing the protocol meet annually, named as Conference of Parties to discuss or amend the existing negotiations. The Kyoto Protocol divides countries into two groups according to the level of their economy: industrialized and developing economies. If, for example, a country

emits less than its target amount of CO₂, then it can sell the surplus credits to other countries that do not meet their emissions level goals established by the Kyoto Protocol. Such buying and selling of Carbon Credits is regulated by a legal contract called ERPA (Emission Reduction Purchase Agreement) [41]. There is also another mechanism called the Clean Development Mechanism specifically addressed to developing countries that issue Carbon Credits for supporting sustainable development initiatives (those Carbon Credits are called Certified Emission Reduction, or CER) [42].

The Kyoto Protocol marked a significant step forward, but its effectiveness was hampered by issues of participation. Notably, the United States as considered a major emitter, did not ratify the agreement, citing concerns about economic competitiveness and the exclusion of developing economies from mandatory targets. The politics of economic competitiveness, national sovereignty and historical responsibility hindered global progress. Despite these challenges, the Kyoto Protocol represented progress in the evolution of international climate agreements. It set a precedent for legally binding emissions reductions and laid the groundwork for the Paris Agreement.

3.1.3 The Paris Agreement: A Beacon of Hope

The Conference of Parties 21 or COP21, also known as the Paris Agreement of 2015, represents a more inclusive and flexible approach to climate politics. It emphasizes the importance of nationally determined contributions (NDCs), allowing each country to define its emission reduction targets based on its circumstances and capabilities. It establishes a common transparency framework to track and review the progress of countries' NDCs. This transparency ensures accountability and encourages ambition over time. This agreement limited global warming to 1.5°C, stating that the GHGs must peak before 2025 at the latest and decline 43 % by 2030 [43]. The agreement also recognizes the need for financial support to developing nations to assist them in mitigating and adapting to climate change. The goal is to mobilize \$100 billion annually by 2020, with discussions ongoing about scaling up financing post-2020 [44].

The Paris Agreement stands as a beacon of hope in the fight against climate change as it represents humanity's collective commitment to address climate change. Its success depends on political will, cooperation and continued ambition as it demonstrated global unity on account of ratification by 190 countries as of 2021. Its universality demonstrates a shared commitment to addressing climate change, transcending traditional geopolitical divisions, while certain challenges remain. It provides a framework for a global transition to a sustainable low-carbon future.

Currently, the Paris Agreement of 2015 and the United Nations Agenda or Sustainable Development Goals (SDGs) are the two main players at global for decarbonization and emission reduction of GHGs [45]. The Kyoto Protocol brought the concept of carbon trading and carbon caps to restrict the nationwide generation of carbon dioxide. Moreover, the Clean Development Mechanism under this Protocol facilitated the development of various new techniques and supported the alternatives to fossil fuels, especially in nations like Brazil, China,

and India. This concept not only improved the climatic conditions but also boosted the economy of the nations.

Table 1: Important Events in International Climate Change Negotiations [46]

Name	Year	Location	Outcome
UN Framework Convention on Climate Change (UNFCCC)	1992	Rio de Janeiro	Countries agree to reduce emissions with “common but differentiated responsibilities.”
Conference of Parties 1 or COP1	1995	Berlin	The first annual Conference of the Parties. U.S. agrees to exempt developing countries from binding obligations
Kyoto Protocol or Third Conference of the Parties (COP-3)	1997	Kyoto	Kyoto Protocol is approved, mandating developed countries to cut greenhouse gas emissions relative to baseline emissions by 2008-2012 period.
Bonn agreement or COP-6	2001	Bonn	Reaches agreement on terms for compliance and financing. Bush administration rejects the Kyoto Protocol; U.S. is only an observer at the talks
Copenhagen Agreement or COP-15	2009	Copenhagen	Declares the importance of limiting warming to under 2°C. Developed countries pledge \$100 billion in climate aid to developing countries.
Durban Convention or COP-17	2011	Durban	Participating countries agreed to adopt a universal legal agreement on climate change as soon as possible, and no later than 2015, to take effect by 2020
Paris Agreement or COP-21.	2015	Paris	195 nations sign the Paris Agreement, providing for worldwide voluntary actions (NDC’s) by individual countries

3.2 Nation-wise politics on climate change

3.2.1 United States

The politics of climate change in the United States have evolved significantly over the past few decades. In the 1980s and 1990s, the U.S. played a pivotal role in international climate negotiations culminating in the signing of the UNFCCC in 1992. Even the U.S. was a signatory to the Kyoto Protocol in 1997 under President Clinton but did not ratify it. Concerns about economic impacts and the exemption of developing nations from binding emissions targets led to the Senate's rejection. Subsequent administrations took different stances on climate change. President George W. Bush withdrew the U.S. from the Kyoto Protocol in 2001, while President Obama committed to reducing emissions and signed the Paris Agreement in 2016 [47]. In the recent past, the Trump administration rolled back several environmental regulations and announced the intention to withdraw from the Paris Agreement. However, individual states and cities took substantial climate action, even in the absence of federal leadership.

In the U.S., climate change has become deeply entangled in partisan politics. Democrats generally advocate for stronger climate policies, while some Republicans question climate science or prioritize economic concerns over environmental ones. Growing public awareness and concern about climate change have put pressure on politicians to take action. Younger generations, in particular have become vocal advocates for climate action [48]. Moreover, many states and cities have taken the lead on climate action. The Regional Greenhouse Gas Initiative (RGGI) in the Northeast and California's cap-and-trade system are examples of state-level efforts to reduce emissions. The influence of the fossil fuel industry on U.S. politics has been significant. The administration has set ambitious targets to achieve a 100% clean energy economy and net-zero emissions by 2050. Various states have implemented renewable energy standards, promoted electric vehicles and pursued regional climate initiatives [49].

The election of President Joe Biden in 2020 signalled a shift in U.S. climate politics. The United States has seen new dimensions in climate change policies with the Biden administration re-joining the Paris Agreement in 2021. Addressing environmental injustices related to climate change is a central theme in the Biden administration's climate policy. Under his governance, the administration has proposed substantial investments in clean energy infrastructure, electric vehicles along with research and development for climate solutions [50].

Thus it is evident that the political factors encompassing climate change in the United States have been marked by fluctuations in policy direction and partisan divides. However, recent developments, including the return to the Paris Agreement and ambitious climate initiatives by the Biden administration, indicate a renewed commitment to addressing this global challenge. Thus in the present scenario, the U.S. stance on climate change plays a crucial role in global efforts to combat the crisis.

3.2.2 European Union

The European Union (EU) has emerged as a global leader in addressing this challenge. EU has been at the forefront of climate action for a few decades with scientists sounding the alarm about rising temperatures and greenhouse gas emissions. Their early initiatives focused on

environmental protection rather than climate change specifically. The EU began developing climate policies in the 1990s, culminating in the adoption of the EU Climate Change Programme in 2000. This program aimed to meet the EU's commitments under the Kyoto Protocol. EU even played a pivotal role in the negotiation and ratification of the Kyoto Protocol. Member states collectively committed to reducing emissions by 8 % below 1990 levels during the Kyoto Protocol's first commitment period (2008-2012). The EU's Emissions Trading System (EU ETS) was a pioneering effort to create a carbon market [51]. The EU ETS is the world's largest carbon market, covering various sectors. It sets a cap on emissions and allows the trading of carbon allowances, providing economic incentives for emissions reductions. The Lisbon Treaty, which came into force in 2009, incorporated climate change as one of the EU's policy objectives. It established a legal framework for climate action within the EU. Six years later, in 2014 the EU adopted a binding target to reduce greenhouse gas emissions by at least 40% below 1990 levels by 2030 [52]. The EU has set a target for 32 % of its energy to come from renewable sources by 2030. Member states are implementing various measures to achieve this goal, including subsidies for renewable energy production. Balancing the diverse interests of member states, especially those heavily reliant on fossil fuels, can be challenging. Transitioning to a low-carbon economy requires solidarity and support for regions most affected by this shift.

Announced in 2019, the EU has also introduced the Green Deal, an ambitious longer-term plan to make Europe the first climate-neutral continent by 2050 [53]. It includes initiatives to increase renewables, improve energy efficiency, and support sustainable agriculture. Moreover, EU climate policies and regulations have often set global standards, influencing climate action beyond its borders, engaging in climate diplomacy, promoting climate action in its relations with other countries and regions, providing financial and technical assistance to developing nations to address climate change. Hence, The EU has been at the forefront of international climate negotiations and has played a critical role in shaping global agreements including the Paris Agreement. However, challenges related to national interests, policy implementation, and economic considerations persist. The EU's role in global climate governance remains pivotal and also its actions will continue to influence international efforts to combat climate change.

3.2.3 China

China being one of the world's most populous country and one of its largest economies, holds a pivotal role in the global response to climate change. Although China is considered to be the world's largest emitter of greenhouse gases, this nation has evolved significantly in recent years, reflecting both domestic and international pressures. In the early years of its rapid industrialization, China prioritized economic development over environmental concerns. Energy-intensive industries drove high levels of emissions. But by the mid-2000s, China began to recognize the environmental and health costs of its rapid industrialization. It also acknowledged its vulnerability to climate impacts, such as extreme weather events. This realization resulted in the ratification of the Kyoto Protocol in 2002, although not subjected to binding emissions reduction targets due to its status as a developing nation. After nearly a decade, China introduced its 12th Five-Year Plan (2011), which included binding energy

intensity and carbon intensity reduction targets. China also actively negotiated the Paris Agreement in 2015 [54-55].

Currently, China has become a global leader in renewable energy production, with significant investments in wind, solar, and hydropower. The country has implemented carbon pricing initiatives and is gradually transitioning away from coal-fired power plants. China has imposed coal consumption caps in key regions and invested in cleaner coal technologies to reduce the environmental impact of its coal dependence. It has invested heavily in renewable energy becoming a global leader in solar and wind energy capacity. China is also having the world's largest solar panel and electric vehicle market. China launched pilot emissions trading schemes in several provinces and cities with plans for a national scheme. This move reflects an attempt to create economic incentives for emissions reductions. Moreover, the nation has incorporated climate and environmental considerations into its BRI projects [56], aiming to promote sustainability in countries participating in the initiative.

The politics of climate change in China reflect a significant shift from a focus on rapid industrialization to an increasing recognition of the environmental, health, and economic risks associated with climate change. The country has committed to peak its CO₂ emissions by 2030 and achieve carbon neutrality by 2060 [57]. Key policy initiatives, such as investments in renewables and emissions trading, demonstrate China's commitment to reducing its carbon footprint. However, balancing the imperative of economic growth with emissions reduction goals and coal dependence remains a central challenge. China's role in global climate governance is pivotal, and its actions will significantly influence the global response to climate change in the coming decades.

3.2.4 India

India, as one of the world's most populous and rapidly developing countries, faces a unique set of challenges and opportunities in addressing climate change. The politics of climate change in India have evolved as the nation grapples with balancing its economic growth ambitions with the need to reduce greenhouse gas emissions and adapt to a changing climate. In the early years of post-independence, India's focus was on industrialization and poverty reduction. Environmental concerns took a backseat as the nation sought to raise living standards. By the late 20th century, India began recognizing its vulnerability to climate change, especially concerning water resources, agriculture and coastal regions. Currently, India is an active participant in international climate negotiations advocating for the interests of developing nations. It has consistently emphasized the principle of "equity" and "common but differentiated responsibilities" [58].

In 2008, India launched the National Action Plan on Climate Change (NAPCC), outlining eight national missions addressing various aspects of climate change, including solar energy, water and agriculture. The nation also ratified the Kyoto Protocol but was not legally bound to emission reduction targets [59]. In subsequent international negotiations like the Copenhagen

Summit in 2009, India emphasized the principle of "common but differentiated responsibilities." The nation has since then taken various initiatives to emerge as a successful candidate globally in the adaptation of protocols and policies to curb climate change. India has pledged to reduce the emissions intensity of its GDP by 33-35 % by 2030 compared to 2005 levels [60]. Thus substantial investments have been made in renewable energy, particularly solar and wind power. The government has focused on expanding renewable energy sources, with a target of 450 GW of renewable energy capacity by 2030 [61]. The Jawaharlal Nehru National Solar Mission aims to generate 175 GW of renewable energy by 2022 [62]. Various other initiatives include Perform, Achieve, and Trade (PAT) scheme and Standards & Labeling program to promote energy efficiency in industries and appliances [63]. The Green India Mission focuses on enhancing forest and tree cover to sequester carbon and improve ecosystems [64]. The International Solar Alliance, The Coalition for Disaster Resilient Infrastructure and the National Clean Air Program (2019) are addressing air pollution and its health impacts which is a growing concern in Indian cities [65-66].

Irrespective of so many advancements, India is still facing various hurdles. Coal continues to dominate India's energy mix, posing a major hurdle in reducing emissions. Balancing energy security with emissions reduction remains a complex task. India acknowledges its vulnerability to climate impacts and the importance of climate action but faces challenges related to its economic development imperatives and energy mix. India seeks international support to finance its climate mitigation and adaptation efforts, emphasizing the principle of "climate justice." Key policy initiatives demonstrate India's commitment to renewable energy, afforestation, and improving energy efficiency. India's role in global climate governance is crucial, representing the interests of developing nations and emphasizing the principle of equity in climate negotiations. As India continues its journey toward sustainability, its actions will significantly influence the global response to climate change.

3.2.5 Brazil

Brazil, with its vast rainforests and diverse ecosystems plays a critical role in global climate change mitigation and adaptation. Brazil's rich natural heritage including the Amazon rainforest has long been a source of national pride. Early conservation efforts focused on preserving these ecosystems. The early 21st century witnessed Brazil's economic rise, driven by industries such as agriculture and mining. Balancing economic development with environmental conservation became a challenge. However, the politics of climate change in Brazil have been marked by a complex interplay of environmental conservation, economic development and political interests. Brazil's political landscape has witnessed changes in leadership with differing views on environmental protection and climate action.

Brazil has faced challenges related to deforestation rates and the protection of indigenous lands. Hence, the country has focused on reducing deforestation in the Amazon rainforest crucial for global carbon sequestration. Brazil has implemented policies to combat deforestation, such as the Amazon Fund and the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon. Initiatives like the Low Carbon Agriculture Program promote sustainable farming practices to reduce emissions from the agriculture sector [67]. This country also plays

a significant role in REDD+ (Reducing Emissions from Deforestation and Forest Degradation), a global initiative to reduce emissions from deforestation and forest degradation [68].

Brazil signed the Kyoto Protocol in 1998 but was not obligated to reduce emissions due to its developing country status. However, the nation recognized the importance of preserving the Amazon rainforest in global climate efforts. Brazil is a signatory to the Paris Agreement and has been active in international climate negotiations advocating for the importance of forests and sustainable development. The nation pledged to reduce greenhouse gas emissions by 37% by 2025 and halt illegal deforestation in the Amazon by 2030 [69]. The nation has also invested in renewable energy sources, including hydropower, wind, and solar energy aiming to diversify its energy matrix. Despite commitments to combat deforestation, Brazil has faced increasing rates of forest loss, driven by factors like illegal logging, agriculture expansion and infrastructure development.

The politics of climate change in Brazil reflect the nation's dual role as a critical contributor to global emissions reductions and a guardian of precious natural ecosystems. Key policy initiatives demonstrate Brazil's commitment to conservation and emissions reduction. However, challenges related to deforestation, economic pressures and political leadership must be addressed. Brazil's position in global climate governance highlights the importance of its role in international cooperation and environmental conservation. As Brazil navigates its climate policy landscape, its actions will significantly influence the global response to climate change and the preservation of vital ecosystems like the Amazon rainforest.

3.2.6 Australia

Australia, known for its vast landscapes and unique ecosystems, faces significant challenges in addressing climate change. Australia has implemented renewable energy policies and initiatives but has also faced criticism for its response to climate change. This nation is vulnerable to climate impacts, such as prolonged droughts and bushfires which have amplified public concerns about climate change. The political aspects of climate change in Australia have been marked by shifting policies, partisan divides and debates over economic interests and environmental conservation. Australia has a history of environmental conservation dating back to the late 19th century. Early efforts focused on protecting natural landscapes and unique wildlife. The country has faced debates and challenges related to its energy mix, particularly its reliance on coal. Given its vulnerability to climate impacts, Australia has developed policies and initiatives to adapt to changing climate conditions, particularly in the areas of water management and agriculture. Climate change has been a polarizing issue in Australian politics with frequent changes in government leading to shifts in climate policy. Australia ratified the Kyoto Protocol in 2007, setting emission reduction targets. However, the nation faced criticism for setting lenient targets and for delays in ratification [70]. This nation implemented a carbon pricing mechanism, the Carbon Pricing Mechanism which aimed to put a price on carbon emissions. This policy was repealed in 2014. In the Paris Agreement Commitment, this country has remained a signatory and has committed to reducing emissions by 26-28 % below 2005 levels by 2030 [71]. However, criticism persists regarding the adequacy of its emissions reduction targets. Australia introduced the Emission Reduction Fund to support emissions reduction projects across various sectors.

Australia has invested in renewable energy sources, particularly wind and solar power. Initiatives like the Renewable Energy Target aim to increase the share of renewable energy in the national energy mix. Moreover, it collaborates with international partners on climate-related initiatives including the United Nations and regional organizations. Australia basically provides financial support to Pacific Island nations for climate adaptation and resilience-building efforts. Australia's position in global climate governance underscores its role in international cooperation and support for vulnerable nations. As Australia continues to navigate its climate policy landscape, its actions will significantly influence the global response to climate change and the protection of its unique ecosystems.

3.2.7 Canada

Canada, known for its vast landscapes and natural beauty, faces unique challenges in addressing climate change due to its resource-based economy and geographical diversity. Canada has a long history of environmental consciousness, with early conservation efforts dating back to the late 19th century. However, the focus was initially on protecting natural landscapes rather than addressing climate change specifically. Indigenous communities often bear the brunt of climate change impacts and have voiced concerns about the environmental effects of resource development. The economy of the country relies heavily on resource extraction, including oil sands and natural gas. Transitioning to a low-carbon economy while safeguarding jobs and economic growth is a significant challenge.

Canada played an active role in international environmental negotiations, including UNFCCC in the 1990s. Canada signed the Kyoto Protocol in 1998 but later withdrew due to concerns about meeting emission reduction targets [72]. The 2009 Copenhagen Summit marked a significant moment when Canada pledged emission reduction targets but failed to adopt binding commitments. Provinces like British Columbia and Quebec introduced their own carbon pricing mechanisms and climate policies, indicating subnational leadership in the absence of strong federal action. Canada has implemented a national carbon pricing system, the Pan-Canadian Framework on Clean Growth and Climate Change. It includes carbon pricing mechanisms such as the carbon tax in some provinces and cap-and-trade systems in others. Besides, the nation has invested in renewable energy sources particularly hydropower and wind energy. Hydroelectric power plays a significant role in provinces like Quebec and British Columbia [73]. Canada has also made significant investments in clean energy and supports initiatives to advance electric vehicle adoption since the nation has committed to reducing its greenhouse gas emissions by 40-45 % below 2005 levels by 2030 [74]. As Canada continues to navigate its climate policy landscape, its actions will shape not only its own environmental future but also contribute to the global response to climate change.

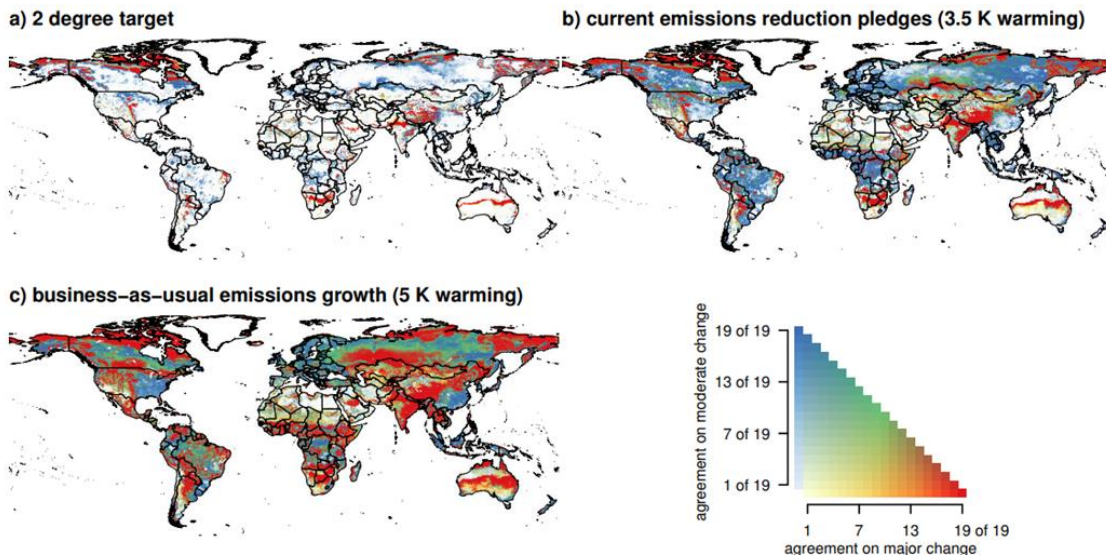


Figure 3: Illustration of regional patterns of simulated ecosystem change by 2100 for different climate policies leading to a GMT increase of 2, 3.5 and 5 K. The colours indicate number of simulations agreeing on either major ($0 > 0.3$) or moderate ecosystem change ($0.1 < 0 < 0.3$) in each grid cell. Reproduced from European Geosciences Union (2013) [75]. Open access.

3.3 Political Barriers and Challenges

Climate change is a pressing global challenge that requires comprehensive political action at national and international levels. However, the politics surrounding climate change are fraught with barriers and challenges often stemming from divergent interests, ideologies, and short-term political considerations. Moreover, the impacts of climate change are not evenly distributed. Vulnerable communities, often those who have contributed least to greenhouse gas emissions, bear the brunt of climate-related disasters and environmental degradation. Climate-induced displacement and resource scarcity can lead to conflicts. Climate justice and equitable policies can help prevent conflicts by addressing the root causes of environmental and social injustices [76]. Climate justice and equity are essential principles that call for fairness in addressing climate change, recognizing historical responsibility, and ensuring that the burden of mitigation and adaptation is shared equitably. Climate justice recognizes that developed nations historically have contributed the most to greenhouse gas emissions. Equity requires acknowledging this historical responsibility and the disproportionate impacts on vulnerable communities. Vulnerable communities, including low-income populations, indigenous peoples and marginalized groups, are often the most affected by climate change [77]. Climate justice seeks to rectify these inequalities by ensuring that these communities have a stake in decision-making and access to resources. It recognizes the interconnected nature of environmental, social and economic issues, and thereby holistic solutions that address not only greenhouse gas emissions but also social and economic disparities. Various causes of political barriers are summarized here.

3.3.1 Short-Term Focus

One of the primary political barriers is the short-term focus of many policymakers. Political terms are typically short and elected officials often prioritize policies that yield immediate

results and public approval. Climate change mitigation often requires long-term investments and may not produce immediate political benefits.

3.3.2 Partisan Divides

Climate change has become polarized in many countries, with partisan divisions hindering the development of coherent climate policies [78]. In some cases, party platforms and ideologies shape climate change stances more than scientific evidence and consensus.

3.3.3 Economic Interests

Fossil fuel industries and other sectors with significant carbon footprints often wield substantial political influence. Policymakers may be reluctant to implement climate policies that could negatively impact these industries or cause economic disruptions.

3.3.4 Lobbying and Campaign Finance

The influence of powerful interest groups and campaign finance in politics can hinder climate action. Lobbying efforts by fossil fuel companies and other industries have sometimes blocked or weakened climate legislation [79].

3.3.5 Misinformation Campaigns

The spread of climate misinformation, often funded by vested interests can confuse the public and policymakers, making it challenging to build consensus on climate change solutions.

3.3.6 International Cooperation

Climate change is a global problem that requires international cooperation. Negotiating and implementing agreements like the Paris Agreement face challenges related to differing national interests, power dynamics, and enforcement mechanisms.

3.3.7 Policy Implementation

Even when climate policies are adopted, their successful implementation can be challenging. This is especially true when policies face resistance from affected industries, local governments or the public.

3.3.8 Just Transition

Transitioning to a low-carbon economy may result in job losses in carbon-intensive sectors. Political challenges arise in addressing the social and economic impacts of this transition and ensuring a just transition for affected communities and workers.

3.3.9 Public Opinion and Engagement

Building public support for climate policies can be challenging, especially when the effects of climate change are not immediately apparent. Politicians must navigate the complexities of public opinion to garner support for ambitious climate action.

3.3.10 Policy Consistency

Political cycles can lead to inconsistent climate policies with one administration rolling back the efforts of its predecessor. Achieving long-term policy consistency in the face of changing political landscapes is challenging.

The political barriers and challenges of climate change are substantial often driven by short-term thinking, partisan divides and economic interests. These hurdles hinder effective climate action at national and international levels. Addressing climate change requires political leadership, bipartisan cooperation and a commitment to long-term science-based policies [80]. Overcoming these barriers and challenges is essential to mitigating the impacts of climate change and building a sustainable future for our planet. It is imperative that policymakers, citizens and civil society work together to push for effective climate policies and hold political leaders accountable for their actions in addressing this global crisis. Developed nations must fulfil their financial commitments to support developing nations in both mitigation and adaptation. Moreover, sharing clean and sustainable technologies with developing nations can help bridge the technology gap and promote sustainable development. To ensure holistic approach, climate policies should be integrated into broader policies addressing poverty, inequality and social justice. The vulnerable communities can be empowered through participation in decision-making processes and providing them with resources and tools to adapt to climate change is crucial.

4. The Economic Dimension

4.1 Carbon Trading Market

A carbon market, also known as a carbon trading market or emissions trading market is a financial system designed to reduce greenhouse gas emissions by creating economic incentives for emitters to reduce their carbon footprint. It operates on the principle that emissions have a cost and emitters must pay for the right to release a certain amount of GHGs into the atmosphere. The Paris Agreement encourages the development of international carbon markets to enhance global cooperation in climate change mitigation. Carbon markets are often established within a cap-and-trade framework [81]. A governing body, often a government or regional organization sets an overall limit (cap) on the total allowable GHG emissions for a specific jurisdiction or sector. Within this cap, the governing body allocates or auctions emission allowances, each representing the right to emit a specific quantity of GHGs (Figure 4). These allowances are tradable assets. Entities subject to emissions regulations, typically industrial facilities and power plants are required to hold enough allowances to cover their actual emissions. If they exceed their allocated allowances, they must purchase additional allowances on the carbon market. Conversely, if they emit less than their allowances they can sell the surplus. The market transactions involve trading of allowances that occur on carbon exchanges or through over-the-counter (OTC) transactions [82]. Buyers and sellers negotiate prices based on supply and demand dynamics. In carbon trading, the participants are typically required to report their emissions and holdings of allowances to regulatory authorities. Failure to comply can result in penalties. Another significant approach is the carbon fee and dividend policy which imposes a fee on carbon emissions, with revenue returned directly to citizens as dividends [83]. It incentivizes emission reductions while protecting low-income individuals from increased energy costs. Imposing a carbon tax is another significant step to curb carbon

emissions. It is a tax on carbon emissions that charges emitters for their greenhouse gas releases providing a clear financial incentive to reduce emissions [84]. The benefits include reduced climate change impacts and improved public health due to reduced air pollution. The costs involve administrative and compliance expenses.

Some carbon markets include mechanisms for emitters to earn carbon credits by implementing projects that reduce emissions beyond regulatory requirements. These credits can be used for compliance or sold to other emitters [85]. The carbon markets allow emitters flexibility in how they reduce emissions. They can choose to reduce emissions internally, purchase allowances from the market, or invest in emission reduction projects. This trading thus provides economic incentives as they create economic incentives for emitters to reduce emissions because doing so can lead to financial gains through the sale of surplus allowances. By allowing emitters to find the most cost-effective ways to reduce emissions, carbon markets encourage innovation and reduce the overall cost of emissions reductions. Moreover, they facilitate international cooperation in mitigating climate change by enabling the transfer of emission reductions across borders.

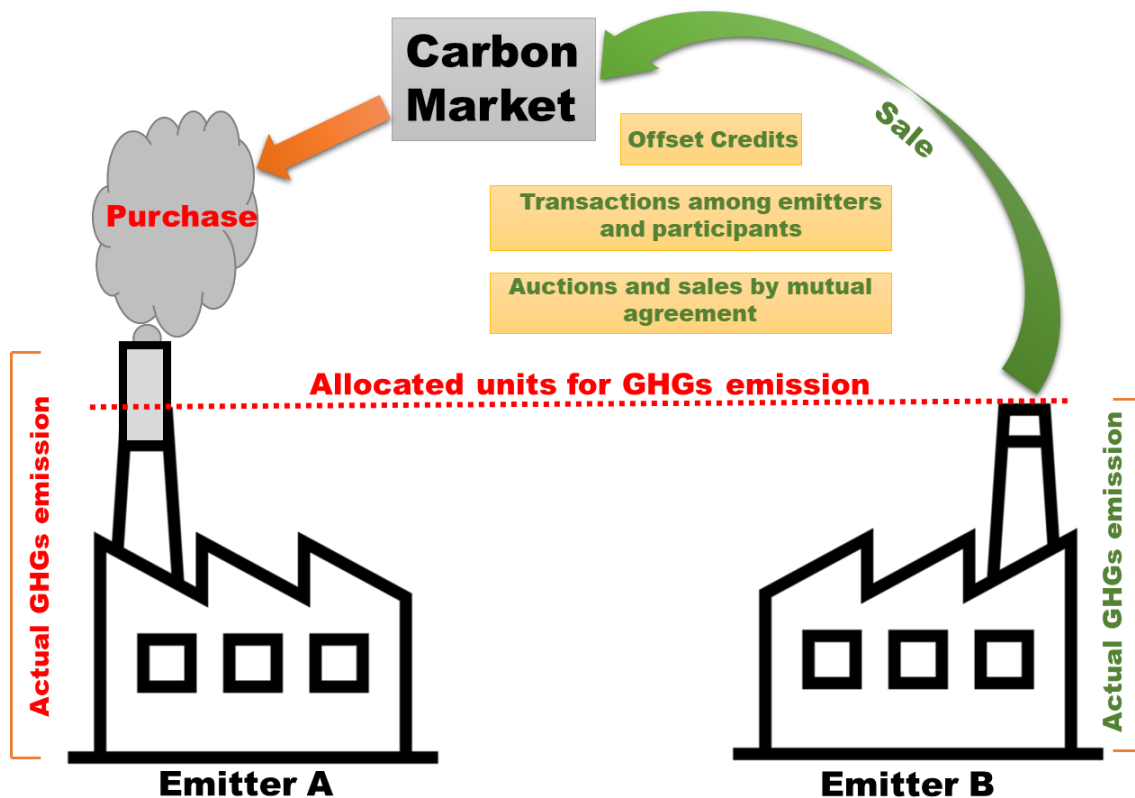


Figure 4: Concept of Global Carbon Marketing

Notable examples of carbon markets include the European Union Emissions Trading System or EU ETS, the Regional Greenhouse Gas Initiative (RGGI) in the northeastern United States, the California Cap-and-Trade Program, and various voluntary carbon markets where organizations and individuals purchase carbon offsets to compensate for their emissions. Carbon markets play a crucial role in addressing climate change by putting a price on carbon emissions and encouraging a transition to a low-carbon economy [86].

However, this trade faces certain difficulties such as the allocation of initial allowances can be politically contentious and decisions can favour certain industries or regions leading to accusations of inequity. Moreover, carbon prices can be subject to volatility, affecting the cost-effectiveness of emissions reductions. To avoid discrepancies, mandatory carbon reporting is now emphasized which requires companies to disclose their carbon emissions and reduction strategies, promoting transparency and accountability. Thus, carbon trading systems must be carefully integrated with other climate policies to ensure coherence and effectiveness. As the world continues to deal with the urgent need for climate change mitigation, carbon trading remains a critical component of the economic response to reduce greenhouse gas emissions and transition towards a sustainable future.

4.2 Green Finance: The Economics of Climate Change Mitigation

Climate change presents a formidable economic challenge that necessitates innovative financial solutions and economic strategies must align with climate goals. It poses significant economic risks, including damage to infrastructure, increased healthcare costs and disruptions to supply chains. The economic consequences of inaction far outweigh the costs of mitigation and adaptation. Besides, the shift towards a low-carbon economy creates transition risks for industries heavily reliant on fossil fuels. Stranded assets, declining demand for carbon-intensive products and changing regulations can lead to significant economic losses. Climate change mitigation presents economic opportunities, including the development of renewable energy, energy-efficient technologies and sustainable agriculture. The green economy is expected to drive job creation and innovation. Green finance, a rapidly growing field, focuses on channelling capital toward environmentally sustainable projects and technologies. It encompasses financial products, services, and investments that promote environmental sustainability [87]. Green finance initiatives, such as green bonds and, sustainability-linked loans, impact investments and more. These mechanisms mobilize capital for climate-friendly projects and help transition economies toward sustainability. Governments play a crucial role in promoting green finance through policies, incentives, and regulations that create a favourable environment for sustainable investments.

The green bonds raise funds specifically for environmentally friendly projects [88]. They provide investors with an opportunity to support climate solutions while potentially earning returns. Another climate resilience bond is the climate-linked bond which issues bonds tied to specific climate resilience projects, such as infrastructure improvements to withstand extreme weather events. The sustainability-linked loans offer incentives for borrowers to achieve predefined sustainability targets, such as reducing emissions or enhancing energy efficiency. Investments in green technologies stimulate innovation and create jobs in sectors like renewable energy, electric vehicles and sustainable agriculture. Thus, green finance helps mitigate climate-related financial risks by supporting investments in resilient infrastructure and sustainable practices. Companies and financial institutions that adopt sustainable practices may be more resilient to climate-related risks and regulatory changes. Other than institutes, firms that embrace green finance can enhance their reputation and appeal to environmentally conscious consumers and investors. However, adequate data on environmental performance

and risks is essential for green finance. Standardized reporting and disclosure mechanisms are critical [89].

However, significant financial hurdles remain, including the need for substantial investment in renewable energy infrastructure. Green finance is still a relatively young field. Building investor confidence and expanding the market are ongoing challenges. As global awareness of the climate crisis grows, the role of green finance in driving positive environmental and economic outcomes becomes increasingly pivotal.

4.3 Circular Economy

Climate change is a global crisis driven by the excessive extraction of resources, emissions of greenhouse gases and the linear "take-make-waste" economic model. The circular economy offers an alternative economic approach that not only reduces environmental impact but also contributes significantly to climate change mitigation. The concept of a circular economy, where resources are reused and recycled, gains importance in addressing climate change while promoting economic growth. Embracing circular practices can reduce waste, minimize resource depletion and create new economic opportunities. Companies are increasingly recognizing the benefits of sustainability both in terms of reputation and profitability. Certain examples related to such circular economy include Extended Producer Responsibility (EPR) programs that make manufacturers responsible for the entire lifecycle of their products, including take-back, recycling and disposal [90]. The Cradle-to-Cradle Design approach that focuses on designing products and materials so that they can be continually recycled or repurposed without loss of quality [91]. Another is the Sharing Economy Platforms [92] that enable the sharing, renting or leasing of products and services reduce the need for individual ownership and promote resource efficiency. Lastly the Closed-Loop Manufacturing [93] where products are designed for easy disassembly and material recovery.

Resource efficiency is a prime factor in the circular economy as it prioritizes resource efficiency by minimizing waste and maximizing the use of materials and products through strategies like recycling, refurbishment and remanufacturing. Moreover, emphasis is given to the durability of the products to extend their lifespan and reduce waste along with the utilization of sustainable and biodegradable materials to reduce the environmental impact of products. The closed-loop approach which aims to close material and product loops, ensuring that resources are continually recycled and reused rather than disposed of after a single use is another significant factor taken into account. These factors in turn forms economic solution [94] for climate change mitigation through the following ways-

4.3.1 Reduced Greenhouse Gas Emissions

By prolonging the life of products and materials circular economies reduce the need for resource extraction and production leading to lower emissions.

4.3.2 Energy Savings

Recycling and remanufacturing processes are often less energy-intensive than primary production resulting in energy savings and reduced emissions.

4.3.3 Less Landfill Waste

Circular systems reduce the amount of waste sent to landfills thereby minimizing the release of methane, a potent greenhouse gas.

4.3.4 Conservation of Natural Resources

Circular economies help conserve natural resources by reducing the demand for raw materials and curbing deforestation and mining activities.

4.3.5 Economic Growth

Transitioning to a circular economy can stimulate economic growth through job creation, innovation and increased resource productivity.

4.3.6 Cost Savings

Circular practices often lead to cost savings for businesses through reduced material procurement and waste disposal expenses.

4.3.7 Market Opportunities

Circular business models, such as product-as-a-service and leasing can create new revenue streams and market opportunities.

4.3.8 Resilience to Resource Scarcity

Circular economies are less vulnerable to resource price fluctuations and supply chain disruptions and thus enhances economic resilience.

Therefore transitioning to a circular economy is not only an environmentally sound strategy but also a powerful economic solution for climate change mitigation. By reducing emissions, conserving resources and creating economic opportunities, circular economies align with the goals of sustainability and climate action. Governments, businesses and individuals must collectively embrace circular principles to drive the necessary systemic changes and accelerate the global transition toward a more sustainable and climate-resilient economic model.

4.4 Cost-Benefit Analysis

Cost-benefit analysis (CBA) is a powerful tool for evaluating the economic efficiency of climate change mitigation policies. Cost-benefit analysis assesses the net impact of a policy by comparing the total costs and total benefits associated with its implementation. In the context of climate policy, it involves estimating the costs of reducing emissions and the benefits of mitigation of climate change impacts. CBA includes discounting or future costs and benefits are typically discounted to present values to account for the time preference of individuals and to provide a basis for comparing investments over time, monetization or costs and benefits expressed in monetary terms [95], which can be challenging for non-market goods like clean air or a stable climate and sensitivity analysis that assesses the robustness of CBA results by considering a range of assumptions and scenarios [96].

4.4.1 Feed-in Tariffs (FiTs)

FiTs guarantee a fixed price for renewable energy producers, encouraging investment in clean energy sources. The benefits include reduced emissions and energy security while costs involve the subsidies required to support higher renewable energy prices.

4.4.2 Renewable Portfolio Standards (RPS)

RPS mandates a percentage of electricity generation from renewable sources. The benefits include emissions reduction and job creation in the renewable energy sector. Costs involve compliance and potential rate increases for consumers.

4.4.3 Energy Efficiency Policies

Energy efficiency standards and regulations mandating minimum energy efficiency levels for appliances, buildings and vehicles are advantageous as they include reduced energy bills and emissions, while costs involve industry compliance and potential upfront costs for consumers. Moreover, government incentives or subsidies can encourage investments in energy-efficient technologies. The benefits include reduced energy consumption and emissions with costs associated with the subsidies.

4.4.4 Research and Development (R&D) Tax Credits

Tax incentives for businesses conducting climate-related R&D Benefits encompass technological advancements and emissions reduction, with costs being the tax revenue foregone.

4.4.5 Afforestation and Reforestation Incentives

Government incentives to plant trees and restore forests, sequestering carbon and enhancing biodiversity. The benefits include carbon sequestration and ecosystem services, while costs involve program administration and monitoring [97].

Thus, cost-benefit analysis is a valuable tool for evaluating the economic efficiency of climate change mitigation policies. When applied rigorously, CBA helps policymakers make informed decisions by comparing the costs and benefits of different approaches. However, it's essential to recognize that not all climate impacts can be monetized. Moreover, some benefits such as improved air quality and public health may be challenging to quantify accurately. Nevertheless, CBA provides a structured framework for assessing the economic feasibility of climate policies and ensuring that resources are allocated efficiently to combat climate change.

5. Conclusion

Global climate change is a complex issue that demands coordinated efforts from political leaders, economists, and citizens worldwide. The intertwining of politics and the economy in this context requires innovative solutions and a commitment to balancing environmental sustainability with economic prosperity. By recognizing the potential for synergy between these two realms, we can work towards a more sustainable and resilient future for our planet. It is established that the impact of global warming is a serious issue of international diplomacy. Political ideologies, international cooperation, economic interests, and cost-benefit

considerations all play pivotal roles in shaping climate policy. To effectively combat climate change, policymakers must strike a balance between economic growth and environmental sustainability, considering the long-term benefits and costs associated with their decisions.

Encouraging international cooperation and commitments to strengthen global climate efforts can presently be a fruitful step toward climate change mitigation. Although the various negotiations and treaties successfully reduced the emissions and certain countries like Norway and Holland could meet the targets, yet various populous nations like India and China are lacking far behind. The foregoing North-South conflict regarding the debate on the rate of carbon emissions is worsening the scenario to some extent. The existing framework of policy and legislation is much more voluntary, seeking significant commitments from the policymakers and the stakeholders. Hence to fortify the climate actions, there are various upcoming conferences, like the Bonn Climate Change Conference (to be held on 5th June 2023) and the 2023 UN Climate Change Conference (scheduled from 30 Nov 2023). Moreover, the implementation of policies that incentivize a transition to clean energy sources while mitigating economic impacts on affected industries can be a progressive step. The successful implementation of the climate policies requires effective involvement of the stakeholders and promoting public awareness along with continuous data-driven research and analysis to adapt climate policies to evolving political and economic landscapes. Since the political domain and economic policy instruments have the potential to abate climate change through alteration of the patterns of energy use, scientific industrial development, effective income distribution, and urging the common people towards sustainable and green technologies, there are still chances of reaching the climate targets before it's too late. By making informed decisions and fostering international collaboration, we can work toward a sustainable future for all.

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Declaration of competing interest

The authors declare that they have no competing interests.

Data and code availability

Data and codes will be available on reasonable request.

Ethical approval

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FDI IN MULTI-BRAND RETAIL POLICY IN INDIA: INPUTS AND RESPONSES

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ABSTRACT

This paper focuses on the multi-brand retail foreign direct investment (FDI) policy in India, particularly the socio-economic implications of the recently adopted critical changes introduced by the government regarding the multi-brand retail FDI policy.

During the planning era, one indeed analyzed the economic policies but the discipline remained focused primarily on designing choices and less so on the way the decisions were arrived at. Hence, there was little understanding of how the state institutions functioned and what are the values that underlined the public policy perspectives are. What was lost in this approach was the attribute that policy is an arena of bargaining and compromises; in short, it is about politics. Taking forward from this notion one can say that political dynamics and contestations also mark the FDI multi-brand retail policy in India. (Mathur, 2013)

The Congress party helmed the UPA II alliance and spearheaded the policy. The policy had two primary stakeholders, the farmers and the unorganized retailers. The UPA II regime had highlighted that if the multi-brand retail policy was operationalized farmers would get a better price for their produce along with better infrastructural development. However, those opposing the policy stated that the large corporates and other bulk buyers of Agri commodities would prefer dealing with bigger farmers who have large amounts of capital. Hence, the smaller farmers ultimately would not benefit in the long run.

Regarding the unorganized retailers, those in favor of the policy stated that the policy would result in the development of the luxury retail segment in India thus improving the consumer experience. Those contesting the multi-brand retail FDI policy have stated that the producers and traders at the lowest level of operations would never find a place in this sector, which would now have demanded mostly only fluent English-speaking helpers. Hence, there would be large-scale unemployment.

Hence this paper sets out to attempt an explanation of the multi-brand retail FDI policy in India, and the responses of various stakeholders to this policy.

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FDI IN MULTI-BRAND RETAIL POLICY IN INDIA: INPUTS AND RESPONSES

INTRODUCTION:

This paper focuses on the multi-brand retail foreign direct investment (FDI) policy in India, particularly the socio-economic implications of the critical changes introduced by the government regarding the multi-brand retail FDI policy.

During the planning era, one indeed analyzed the economic policies but the discipline remained focused primarily on designing choices and less so on the way the decisions were arrived at. Hence, there was little understanding of how the state institutions functioned and what are the values that underlined the public policy perspectives are. (Mathur, 2013)

As the eminent economist, Sukhamoy Chakravarty stated ‘issues that bear upon India’s developmental prospects are inevitably very complex. Moreover, they cannot be devised by technocratically inclined civil servants.’ (Mathur, 2013: Introduction) The arena of public policy analysis is central to the discipline of Political Science. One can say that political dynamics and contestations have carried on to this day, and in this backdrop, it is significant to analyze the issue of FDI multi-brand retail policy in India.

OBJECTIVES OF PAPER

- To analyze the recently formulated multi-brand retail FDI policy.
- To analyze the inputs and responses of the various interest groups regarding the issue of FDI in retail.

SOURCES AND METHODOLOGY

The paper is descriptive and analytical. It draws on the secondary literature available in journals, and newspapers (notably the *Economic Times*). The paper also attempts to use various government of India reports such as the annual reports of parliament, ministries, (particularly the finance ministry, ministry of agriculture, and the commerce ministry), and departmentally related standing committees of parliament.

This paper becomes essential as the multi-and retail FDI policy is a relatively new policy, and it is difficult to gain information on the contentious process and contours of policy-making within ministries, and the impact of external influences from the corporate world, civil society organizations, farmers, and retailers.

THEORETICAL FRAMEWORK

Since the FDI in multi-brand retail policy looks at the public policy process the theoretical framework of any policy can be divided into three segments. ‘Ideas’ which looks at how the ‘idea’ behind the policy has evolved in the country from the immediate post-independence years to the present. This will help to explain how different political regimes approached and molded the policy. ‘Institutions,’ to understand how the institutions of our country are playing an important role in the formulation of the policy. And finally, ‘interests,’ which looks at how the interests of the stakeholders will be affected, to draw a comprehensive understanding of this policy, and also determine who benefits from this policy in the long run.

Since in this paper, I will look at inputs and responses I will look at the ‘interests.’

➤ **Interests**

If one looks at groups in general, all structures in society are multifunctional. Patterns of group identity, mobilization, and politicization serve as channels of communication between individuals and the state. The primary function of groups is to act as a mechanism for the articulation of demands and pressing group claims on the political system. (Kochanek, 1974)

Sometimes the concept of rationality and public interest lead decision-makers to turn a deaf ear to groups and be so unresponsive that the groups resort to direct action. (Kochanek, 1974) Regarding the FDI in Multibrand retail policy, one can see that there are various interests, conflicts, and stakes of various parties that are at play, which play an important role in understanding the impact that this policy will have in the future. (Kochanek, 1974)

There are primarily two sectors that will be impacted the most as far as this policy is concerned. One is the farming sector, and the other is the unorganized retailers. Concerning the farming sector, the proponents of the FDI in the retail sector also argue that this policy is also a major step towards providing liberation to the farmers from middlemen and ensuring remunerative prices for their products. The opponents argue that if the foreign MNE’S are directly allowed to deal with the farmers, they would be exploited as the foreign companies will be coming solely for their profit motives.

In the unorganized sector, one of the benefits being highlighted is the creation of large-scale employment. However, the opponents of this policy state that it appears more likely that any hasty decision to open up the retail sector, to FDI could cause dislocation to the existing traditional supply chain and cause unemployment.

Given this backdrop, the recent clamor about opening up the retail sector to Foreign Direct Investment (FDI) has become a very sensitive issue, with arguments to support both sides of the debate.

Hence, one can say that the impacts and interests of the stakeholders stated above need to be taken into account to draw a comprehensive sketch of this policy.

INTRODUCTION

Foreign investment denotes investment made by a non-resident entity in an enterprise in the host country. This can happen through FDI (Foreign Direct Investment) and Foreign Portfolio Investment by FIIs (Foreign Institutional Investors) or private equity funds etc. The FDI denotes foreign capital with a longer-term perspective is often invested in a productive enterprise and may seek managerial control over the company. Of many other modes of getting external finance, FDI is the preferred mode due to its long-term stable nature. It is less volatile and does not generate or add to debt liabilities for the host country. (Rajya Sabha, 2012) In India, the FDI flow is allowed either through the Government route or an automatic route.

On 14 September 2012, the government of India announced the opening of FDI in multi-brand retail, subject to approvals by individual states, and on 20 September 2012, the Government of

India notified the FDI reforms for single and multi-brand retail. On 7, December 2012, the Government of India gained the approval of the policy in parliament.

The architect of the multi-brand retail FDI policy was the former commerce minister of our country, Anand Sharma. He clearly stated that this policy would result in a significant boost of global investor sentiments towards our nation. He also said that the policy was approved after consultations with various stakeholders on board. Echoing the views of the government the then, commerce minister stated that foreign investments were needed in the country to build modern warehouses and infrastructures.

However, the policy was marked with controversy. Making matters worse for the UPA the issue of bribery of Walmart made it the target of Opposition attacks in Parliament, forcing the government to start an inquiry. Many opposition leaders quickly questioned the government, despite numerous protests whether the multibrand retail FDI policy was urgently pushed through by Walmart by bribing the top Indian officials. BSP and SP, which lend outside support to the Congress-led ruling coalition, joined Opposition parties in demanding the probe. This further compounded the problems of the government which was desperate to have the stamp of parliamentary approval regarding this policy.

Certain leaders, however, believed that obstruction of this policy was a mere ploy of the opposition to disrupt parliament. In parliament, Kapil Sibal stated *“One of the ways also to garner foreign exchange, which will reduce the deficit, is to allow FDI in sectors that will benefit the economy of this country. Therefore, that is also one of the reasons, apart from the fact that it is beneficial to farmers, beneficial to consumers, beneficial to the economy, and beneficial to creating employment.”* (Lok Sabha, 2012)

The opposition quickly demanded a vote even though the FDI in multi-brand retail policy was an executive decision taken by the central government which according to our Constitution does not entail any voting in the house. The opposition clearly stated that the process of consultation with all the political parties, and other stakeholders was not undertaken by the government and the FDI in multi-brand retail FDI policy was imposed by the erstwhile UPA II regime. The UPA II ultimately won the vote in parliament. (253 votes in favor and 218 against)

Hence the UPA-II which framed this policy stated that the operationalization of MBRT would create jobs and would be in the interest of farmers and consumers. However major regional parties and the left parties opposed this policy, stating that would lead to massive unemployment.

Hence, one can say that the multi-brand retail FDI policy indeed become both a contentious and controversial policy decision.

INPUTS AND RESPONSES: THE FARMING SECTOR

Positive Assessments

India as a country has a large young population that seeks better quality and branded products. Leisure, food, and shopping are very attractive destinations for foreign investors. Hence, the

recent spurt of interest in promoting retail chains has triggered a fresh debate in India, which, in a way, echoes the larger scenario prevailing in the developing economies in Asia and Africa. The debate is particularly relevant in the context of some agrarian economies with an overwhelming presence of small producers operating in the informal sectors and also a huge number of poor consumers scattered all over the countryside. (Shah, 2011) The positive responses to the policy came from the government of the day and the corporate lobbies in India.

The UPA II in its announcement of its intention to open the retail sector for the MNC retail chains has primarily argued for the investments in the agrarian sector by the foreign retail companies. According to the UPA government when the multi-brand retail policy is operationalized then the farmers will get a better price for their produce along with infrastructural development which will result in the improvement of the financial conditions for the farmers. They stated that the foreign retailers will also help the farmers in organizing because there will be a corporate buyer who will give fair prices to the farmers. This will not just be beneficial to farmers, but also to Indian consumers.

The inadequate market access and cold storage apparatus coupled with the lack of food processing and transport bottlenecks have resulted in high rates of wastage and perishability of agricultural goods. (NABARD, 2011) Hence the FDI in the cold chain logistics consists of pre-cooling facilities, cold storage, refrigerated carriers, packaging, and warehousing and information management system would be a bane to the agrarian sector.

Regarding the issue of cold chains, B. Thiagarajan, former Chairman, of the Task Force on Agriculture and Food Processing, CII, stated,

“With the onset of multibrand retail, the food and packaging industry will also get an impetus. Though India is the second largest producer of fruits and vegetables, it has a very limited integrated cold-chain infrastructure and is one of the weakest links in the agriculture supply chain.” (CAIT, 2012: p. 44)

At present today, the farm produce passes through seven layers before it reaches consumers from the farmers. These are the rural primary market, local processors, commission agents, regulated markets, and two levels of wholesalers and retailers. It is expected that these seven layers shall be reduced to four by these organized retail stores and in turn substantial benefits shall accrue to the farmers. (CAIT, 2012) Hence since the foreign retailers would resort to direct marketing the advent of middlemen in the agrarian sector would considerably be reduced.

It is also said that global integration as a result of the entry of foreign retailers can also potentially open export markets for Indian farmers and producers. Walmart, for example, expects to source and export some \$1 billion worth of goods from India every year. Where supermarkets cannot source from medium- or large-scale farmers and small farmers lack the needed assets, supermarket chains (or their agents such as the specialized and dedicated

wholesalers) sometimes help farmers with training, credit, equipment, and other needs. (Subba, 2013)

Many also argue that the foreign retail chains will also do a systematic overhaul of the trading system in the agrarian sector as foreign retail giants will ensure comparably more returns for the production of agricultural produce. (CAIT, 2012)

Hence the proponents of the policy state that foreign investments in the agrarian sector would bring much-needed investment and technologies (particularly cold chain infrastructure) to the agrarian sector.

Negative Assessments

However, those opposing the policy stated that the large corporates and other bulk buyers of Agri commodities find the transaction costs of dealing with a large number of small producers high and prefer dealing with bigger farmers. Hence, the smaller farmers ultimately will not benefit in the long run. Many economists state that corporates will eventually create a situation where farm prices will remain low. Since the supermarkets have high-quality products and they will not easily give up the market access to the Indian farmers and especially the small farmers will eventually be eliminated.

Criticizing the retail FDI policy, Davinder Sharma noted journalist stated,

“Anand Sharma says that FDI will provide 30 percent more income to the farmers, there can be no bigger lie than this. (CAIT, 2012, p. 25) In the US, for instance, if Walmart was able to enhance farm incomes there was no reason why the American government would dole out a massive subsidy of US\$307 billion under the US Farm Bill 2008, which makes a budgetary subsidy provision for the next five years. Most of these subsidies are clubbed in the category of the green box under the WTO. And as per a UNCTAD-India study, if the green box subsidies are withdrawn, American agriculture faces a collapse.” (CAIT, 2012, p. 25)

FDI in agriculture would lead to the large-scale emergence of contract farming in the sector which would be detrimental to the farmers in India. If one looks at the Pepsi project in Punjab, it already disillusioned a large number of stakeholders like the Akali Dal, PAIC, Voltas, and the Bhartiya Kisan Union (BKU). Other than the supply of seedlings and the procurement of only a specified quantity of a certain quality of produce at a pre-fixed time and price, the company's contract offered nothing to the growers. While the contract gave the company the right of refusal to pick up contracted produce, growers were liable to be penalized if they defaulted from their commitment.

The condition of farmers in the West is itself very vulnerable. There is no level playing between corporate retail chains and the farmers. As a result, day by day, the number of farmers moving out of the agricultural business is very high in Europe and the USA. (CAIT, 2012)

In Mexico, nearly 12.5 Lac farmers have left farming activities (which constitutes 25% of the total farming population) and are going to the neighboring USA, for jobs illegally. (Sirohi, n.d)

Shekhar Swami, former Chief Executive Officer, of R.K. Swamy Hansa Group states, *“Farmers in the West have paid a big price, with hundreds of thousands forced to shut down their farms, due to the corporatization of the farming sector, along with the concentration on the purchasing side among processors and retailer big retail in the West and elsewhere functions on a simple business model. (CAIT, p.26) Grow bigger and bigger till the market becomes an Oligopsony-a situation where a small number of buyers exert power over a large number of sellers. The UK food retailing industry, for example, is now dominated by just four supermarket chains that together account for over 60 percent of food sales. This results in the retailer exercising enormous control over their suppliers, which includes the farmers.”* (CAIT, p.26)

Hence the opponents of this policy clearly state that FDI and private investments in this sector would not benefit the smaller farmers who lack access to capital, resources, or information to deal with the big foreign players.

INPUTS AND RESPONSES: THE UNORGANIZED RETAILER

Retailing occupies a pre-eminent position in the economics of all modern societies, and it is certainly true that the pace of development within retailing appears to be accelerating. The organized retail sector in India also has been witnessing changes in the last couple of years. (Kumar, Patwari, and Ayush, 2008)

There are many debates on how the FDI in multi-brand retail policy will help the unorganized retailers of our country. Regarding the multi-brand retail FDI policy, one side of the debate stated that the policy will benefit the unorganized sector of our country as it will aid the unorganized retailers and help in their infrastructure development. In the longer run, as profits are reinvested and organized retail keeps on expanding, the retail FDI policy would benefit unorganized retailers. (Sarkar, 2013) The other side of the debate states that the unorganized retailers won't be able to compete with the foreign MNEs and will also lead to large-scale unemployment for its workers if entities like Walmart set up shop in the country.

If one looks, at the multi-brand retail FDI policy one can see that two polarized points of view can be seen. On the one hand, the corporate sector favors MBRT, on the other hand, there the unorganized retailers who were very vocal about its opposition.

Positive Assessment

The Government's move to allow 51% FDI in the multiband retail sector received considerable support from the corporate houses in India. According to them, this policy decision not only benefits the new players in the retail business but also has a positive impact on existing retailers such as Pantaloon Retail, Shoppers, Bharti Retail, Trent, Reliance Retail, and Aditya Birla Retail. The Indian corporate lobby has also clearly stated that FDI in the organized retail sector should not be a major bone of contention for small retailers (Kirana Wallas) and in the end, it would result in employment generation. (“Tata Steel MD,” 2012) I will state some of their responses below.

The CII stated that FDI in retail would bring much-needed capital inflows into the country. Its view was that FDI in multi-brand retail should include both strategic & financial investors and hence it is important to encourage financial investments, including FII's and private equity, into retail since this would bring in a large inflow of funds. ("Tata steel MD," 2012)

ASSOCHAM also added that opening the retail industry to global competition would spur retail a retail rush to India. Fresh investment in Indian organized retail will generate 10 million new jobs (ASSOCHAM, 2015) 5-6 million jobs in logistics alone.

Stating the advantages of this policy CRISIL Research stated in a report stated that the government's move to allow 51 percent FDI in multi-brand retailing would attract investments of USD 2.5-3 billion in the retail sector in the next five years. However, the report also stated that the immediate and much-needed positive impact of these measures will depend on the investment climate and business confidence. ("Oppose FDI in retail," 2011)

It was also stated that consumers will benefit from both price reductions and improved selection, brought about by the technology and know-how of foreign players in the market.

Emphasizing the positive impact of FDI, particularly the multi-brand retail sector, the DIPP informed that the FDI would bring more investment in the economy that will benefit domestic companies. It would introduce new technologies, internationally accept managerial practices, and thereby facilitate gradual integration into the global market. (Parliament of India, 2012)

The study commissioned by the Government of India through the Indian Council for Research on International Economic Relations (ICREIR), entitled "Impact of Organized Retailing on the Unorganized Sector" (2008) referred to independent industry estimates and studies on the subject and observed that organized retail will create quality labor class at graduate and tenth plus levels by providing vocational training and skills to them.

Hence it is stated that the multi-brand retail FDI policy will enhance the potential of the Indian economy including the small-scale manufacturing sector, food processing, textiles and apparel, construction, IT, transport, cold chain, and other infrastructure. It would replace low-end, low-quality, underproductive jobs with high-end and high-skill jobs. (Parliament of India, 2012)

Hence the proponents clearly stated that undue politics is played over and it is hampering India's investment confidence.

These are the positive arguments that the multibrand retail FDI policy has generated. However, most of the stakeholders and scholars analyzing this policy also state that this policy will be detrimental to unorganized retailers in the long run. I will now look at the negative assessments of this policy.

Negative Assessment

Looking at the issue of grocery retail, it is a link between consumers and millions of often poor rural producers and is itself one of the most important sources of livelihood for low-income households in the urban informal sector. (Dufey, Greg-Gran, Ward, n.d)

However, the bulk of the argument of the opposition towards the retail FDI policy on unorganized retailers is that the advent of foreign retailers in the unorganized sector will result in tremendous job losses. The decision to open the retail sector for FDI is going to affect the 3.5 crore people who run their small shops or work as employees and another 1.5 crore people who re-engage in wholesale trade, transportation, warehousing, etc. In all, five crore people and approx. 20 crore family members are dependent on this sector for their livelihood. (Lok Sabha, 2012)

At present about 35% of the total merchandise sold in India through small unorganized retailers is sourced from small and medium enterprises. (CAIT, 2012) The small independent Kirana stores, which are the second biggest employer after agriculture, with around 42 million jobs that account for 14 percent of GDP, use mainly their family labor. So, any policy changes that affect the structure of grocery retail in India are linked to development and poverty reduction. (Dufey, Greg-Gran, Ward, n.d)

About the unorganized retailers these reports stated that if big foreign retail forces the closure of small retailers, or if this avenue is blocked, there will be a huge loss of livelihood for people who cannot be engaged easily elsewhere. The global sourcing of products will surely reduce employment in Indian manufacturing. There will also be no level playing field between the foreign superstores and the small farmers.

Also, the domestic retailers of India will be unable to compete with large retailers like Walmart, who not only have sophisticated technological prowess but are also vastly experienced in the retail market. Since the main endeavor of the foreign companies is to dictate prices hence; it will be difficult for the Kirana stores to survive. Hence, these companies will be able to monopolize the markets very quickly. There is another argument that global retailers also might resort to predatory pricing. There is always the possibility that foreign retailers may source their products from low-cost producers in China, and dump these cheap items in the Indian markets, hence killing the Indian industries.

The multi-brand retail FDI policy has also generated negative responses, primarily from the domestic trading bodies of India. Praveen Khandelwal, General Secretary CAIT stated that the domestic retailers of India will be unable to compete with large retailers like Walmart, who not only have sophisticated technological prowess but are also vastly experienced in the retail market. Large retailers can also obtain favorable terms from manufacturers and other suppliers due to their financial clout and technological capacities.

Devendra Sharma in his article, Five Reasons to FDI in Retail, published in *Reformist India* dismissed the argument that the operationalization of the multi-brand retail FDI policy will lead to job creation. He stated, “*The biggest argument for multibrand retail is that it will create 10 million jobs by the year 2010. (CAIT, 2012, p.10) There is no justification for this claim. In the United States, Walmart dominates big retail. It has a turnover of US \$400 billion and employs 2.1 million people. Ironically, the Indian retail sector too has a turnover of US \$400 billion, but has 12 million shops and employs 44 million people. (CAIT, 2012, p.10) It is the Indian retail that is a much bigger employer, and any effort to allow Walmart will only destroy millions of livelihoods.*” (CAIT, 2012, p.10)

If one looks at the international examples which show how foreign retailers have had adverse impacts regarding wages and employment ratios and had wiped out the local unorganized retailers. I will in brief look at some of the studies in this regard.

If one looks at international examples research by JP Morgan Chase, cited by the ILO, indicated that 500,000 locally-owned retail stores were pushed out of business by foreign-led competition in Thailand. ((Dufey, Greg-Gran, Ward, n.d) The spread of supermarkets also led to a 14% reduction in the share of “mom and pop” stores in Thailand within four years of FDI permission. (Singh, 2011) Also, in Thailand, over 30% of the local shops were forced to shut within ten years of the entry of foreign retailers.

Indian-origin Labour Party MP Keith Vaz also stated: “*Indian legislators to be careful while handling the issue of FDI in retail, cautioning that a major dominance by a supermarket may not be in the interest of the common man.*” (Singh, 2011)

The condition of the women employees is also worse. Many global estimates also state that foreign supermarkets exploit women’s labor in their stores. The UNI-based global union states that in the year 2010, 7,98,881 women were placed in supervisory posts at Walmart whose minimum wage was 8.81 dollars per hour, which was the lowest among all the employees in America. More than 15 lac women filed a case against Walmart, which was amongst the biggest cases in America. (Sirohi, n.d)

Hence, one can say that if big foreign retail forces the closure of small retailers, or if this avenue is blocked, there will be a huge loss of livelihood for people who cannot be engaged easily elsewhere. This will surely reduce employment in Indian manufacturing.

CONCLUSION

This study set out to attempt an explanation of the multi-brand retail FDI policy in India, the politics of the policy formulation, and the responses of various stakeholders to this policy.

Policymakers in India are wary of making changes involving the retail sector that might harm small businesses which could adversely affect employment. But at the same time, they are also

seeking ways to promote greater efficiency and productivity in a growing sector of the economy that presently accounts for 37% of the country's gross domestic product (GDP). While trying to meet the latter objective, infusion of foreign direct investment in all segments of the retail business is presented as the most significant step, and therefore, policy changes are being proposed to invite the major retailers in the global business into India.

If one looks briefly at the debate regarding the policy scholars and economists favoring this policy feel that this policy will eliminate the middlemen allowing the farmers to deal directly with the foreign MNE, leading to an advantage for the farming sector. However, on the other end of the spectrum also think that if this policy is operationalized it will distort the current agrarian market structure in India.¹

Regarding the unorganized retailers, the erstwhile UPA II had stated that the existence of the major retail chains even in advanced countries had not wiped out the small shopkeepers, the multi-brand retail FDI policy will help the domestic retailers in India get the much-required technology from their foreign counterparts, resulting in technology spillovers. A thriving retail industry also would help the manufacturing sector, where additional jobs would be created. The Indian corporate sector also stated that this policy decision not only benefits the new players in the retail business but also has a positive impact on existing retailers.

The main question that one needs to ask is how India could ensure that international, rules, norms, or standards, reflect the interest of not only the country but also the people in the lower rung of our society.

In this day and age of globalization, there is tremendous external pressures result and any policy today inadvertently reflects the interests of the big powers. Hence, the critical question that needs to be asked is, whether the Indian state under globalization is getting captured by capital or is it able to use the capital to promote India's economic progress. (Mukherji,2005)

In this age of liberalization, it is quite difficult to maintain a balance between welfare and large-scale reforms. Looking at the policy of FDI in multi-brand retail it is quite clear that the policy was pushed prematurely without consulting the opposition or the stakeholders of this policy. The question that one can ask is why there was so much urgency to push this policy in parliament, and why the NDA government still has not reversed this policy which it had claimed it would do if it came to power.

It is the Western world and its institutions such as the IMF, WTO, and the World Bank which dominate the economic order today. Hence it is quite clear that policymaking today is heavily influenced by external conditionalities. It is also quite clear that FDI in the multi-brand retail policy of our country was one such policy.

Summing up I will end with a quote from former Maharashtra Chief Minister Prithviraj Chavan

¹ <http://agmarknet.nic.in/stminprreform.pdf>

“These are exciting times. Decisions taken today may appear to be small, but they are momentous ones, which have redefined the relationship between politics and economic decision-making.” (“FDI has redefined link,” 2012)

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Trade Openness and Economic Growth of Sri Lanka from 2000 To 2021

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ABSTRACT

Economic reforms were started in the economy of Sri Lanka in 1977. Sri Lanka has continued her emphasis on open economic policies during the last 30 years. This economy has three sectors viz primary sector, secondary sector and service sector. Globalization has brought about sectoral change in the economy. The tertiary sector or service sector has played the prime role. The shares of the primary and the secondary sector have been declined and that of the service sector has enjoyed a rising trend. In 2006 the service sector has contributed more than 56% in Sri Lankan GDP. The main source of inflow foreign currency of the country is tourism which has been badly affected by not only the COVID situation but also due to the deadly bomb attacks in 2019 and hampered the trade of the country. Sri Lanka's export to India and US grew by 21% and 46% respectively, says the studies in the early 2021. An endogenous economic growth model is used in this study to understand the long run relationship between trade openness and economic growth in Sri Lanka by using the data ranging from the year 2000 to 2021. Trade Openness index has been developed in this paper. An autoregressive lag to cointegrate and rolling regression methods are used here to find out our main intension and to check the stability throughout the time span.

Keywords: Trade Openness, Economic Growth,

JEL Classification: F43, O11, O16

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1. INTRODUCTION

Sri Lanka is a significant island nation in the Indian Ocean, close to India's southern coast, and an integral part of the SAARC trading bloc. The Gross Domestic Product of this country has been increasing constantly since their globalisation that took place 30 years back. In 1960, the GDP in US Dollars were 14 that rose to 163 in 2000 and 839 in 2019, during the year of bomb attack which affected the economy. The GDP slides down during the year of pandemic in 2020 to 809\$, but again it rose back in 2021 to 845\$. There was a steady economic growth in the country for the past two decades. An increase in foreign investments, improvement of the infrastructure and the rapid growing tourism industry are some of the key factors that almost doubled up the GDP since 2000. Over the span of years, the Government has carried out several policies that focused on attracting the foreign companies to grow their business in Sri Lanka. Thus, eventually Sri Lanka became one of the most popular havens for foreign investments in South Asia. Hence, this foreign investment has helped the country to boost its manufacturing and service sectors, which became a progressive and important contributor to the country's economic growth. Another factor that led to the growth of the country is the improvement of the infrastructure. The Government has made massive investments by improving the roads, bridges, and other infrastructure, which made the transportation system smooth for the businesses to transit goods and services. This helped in reducing the cost and increase the efficiency which in turn boosted the economy. The tourism industry has also played a distinctive role in the economic development of the country. Lately, the Government has taken up initiatives to promote the tourism of the country as it is blessed with beautiful beaches, rich cultural tradition and natural sceneries which made it a prominent tourist destination. The Government has provided tax breaks to the hotel industry and expanded its airport capacity. Regardless of these positive trends, Sri Lanka has faced some serious challenges recently. The COVID-19 pandemic impacted the country's economy significantly as tourism and other industries have been hit hard. On top of it, the country's political instability and corruption have also hindered economic growth. Tariff reduction, simplification of trade procedure and creating trade free zones has led to an increase in trade openness of the country. But Sri Lanka has also faced trade deficit in the recent years with imports exceeding the exports. This has drawn attention about the sustainability of the trade policies and the effect on the balance of payment of the country.

2. LITERATURE REVIEW

Trade openness shows the extent at which the country is engaged with its international trade. On the other hand, economic growth of the country increases the output of goods and services. The relationship between trade openness and its impact on economic growth has been a considerable topic of discussion among economists since a long time

In the presence of economies of scale in the investment technology, trade openness may have non-conventional effects on the level of investment, its cyclical behaviour, and the volatility of the terms of trade as stated by Razin et al (2002).

With Sri Lanka as a case study, Athukorala and Jayasuriya (2000) investigated how policy reforms had an impact on trade. They claimed that the shift in political party resulted in the implementation of various economic initiatives. And shortly after the war, there was a population expansion, raising the urgent issue of the need for increased work in the near future. Import limits and foreign exchange licencing were then implemented, which "forced" import substitution and import limitations. Like their counterparts in other developing nations, Sri Lanka's policymakers anticipated that the expansion of IS industries would lessen the economy's significant reliance on imports. But the truth was very different. Although imports of consumer products were significantly decreased, this was done at the price of a greater reliance on imported capital goods and raw materials, which, contrary to expectations, led to an even more inflexible dependency on imports. Due to these structural characteristics, the growing dynamism of the newly formed industrial sector tended to display a close functional link with the success of the conventional export sectors. As a result, the principal obstacle to industrial development since the late 1960s has been unforeseen import curtailments brought on by a lack of foreign money.

Soon after, growth slowed and new investment in import substitution started to rise (Kruger, 1992).

By making excessive profits in a nation with significant trade distortions, such as high tariffs, foreign capital can reduce economic development, according to Brecher and Diaz-Alejandro's (1977) research. In their econometric analysis of foreign direct investment and the growth of gross domestic product, Maria Carkovic and Ross Levine (2002) likewise came to the conclusion that the exogenous part of FDI does not have a significant, independent impact on growth.

The author gives a review of the empirical research on the influence of trade liberalisation on economic growth in Sri Lanka, as demonstrated by Herath, H.M.S.P. (2010). Previous research has revealed varied findings, with some studies finding a favourable association between trade liberalisation and economic development and others finding no meaningful relationship. Previous research employed various methodology and data sets, which may have led to the variations in their conclusions, according to the author. The literature review portion finishes by emphasising the present study's contribution. The latest study, according to the author, overcomes some of the shortcomings of prior studies by adopting a bigger sample size and the ARDL bounds testing technique, which allows for the analysis of both short- and long-run links between trade liberalisation and economic development. The author also mentions that the new analysis contains crucial variables that earlier studies have neglected, such as investments from abroad and spending by the government.

The empirical research on the link between financial progress, trade openness, and the growth of the economy in developing countries is reviewed by Nabila Asghar and Zakir Hussain (2014). Previous research has produced varied findings, with some studies showing that financial stability and trade openness have a favourable influence on economic growth and others finding no significant association or possibly a detrimental impact. The authors speculate that the disparities in findings may be related to discrepancies in prior research' techniques and data. The literature concludes by emphasising the current study's contribution. According to

the authors, the new analysis overcomes some of the shortcomings of prior studies by adopting a bigger sample size and the fixed effects model to account for a possible endogeneity of financial growth and trade openness. The authors also point out that the present analysis contains significant variables that past studies have neglected, such as human capital, inflation, and political stability.

In one of the early studies on the topic, Baldwin (1969) discovered a positive association between the two factors, concluding that nations with greater commerce experience higher growth in their economies. Later, Edward (1993) conducted a study on 18 Latin American countries Over a time span of 30 years, and found that countries with higher investment particularly, has a positive effect on economic growth.

Frank and Romer (1999) also conducted a study on 76 countries, over a time period of 30years, using panel data, and discovered that trade openness had a favourable impact on economic growth but only in the countries with high level of human capital. Whereas, Rodriguez and Rodrick (2001) examined data of 90 countries for 30 years' time span and also found trade openness has a good impact on economic growth, but only in nations with high-quality institutions. According to Karas (2003) analysis of data from 161 nations, trade openness has a beneficial impact on economic development. He found that when trade openness rises by 10 percent, GDP also increases by 0.25 percent to 0.3 percent. On one side as we see that trade openness has a clear effect on GDP for developed countries, but on the other side, it has an adverse on the growth of the developing countries (Kim, 2008).

3. RESEARCH QUESTION

How did trade openness affect the economic growth of Sri Lanka for the past 21 years?

We know that the trade liberalisation of the country took place in 1977 and it showed a positive impact to the growth of the economy. However, following liberalisation, the country experienced several challenges such as political unrest, poor economic policies, and so on, resulting in the country's massive financial debt.

In this study, we will examine the link between trade openness and economic development following liberalisation while keeping the country's existing status in mind.

4. DATA AND METHODOLOGY

We have collected data for this empirical study from the official website of Central Bank of Sri Lanka and World Development Indicators published by the World Bank. The variables used here are import and export, gross fixed capital formation, human capital and GDP data taken from 2000 to 2021. The import, export, gross fixed capital formation data were found missing from 2000 to 2005, we have used interpolation method in order to find out the missing data. We used economic growth as a measure of GDP (taken in US Dollar), gross fixed capital formation is presented here as physical capital and total employment (as percent of gross) is the proxy variable of human capital. We have taken several proxies of trade openness such as export and import separately as a proportion of GDP and import plus export individually as a proportion of GDP in order to demonstrate a long-term association between Sri Lanka's

economic development and trade liberalisation. However, selecting the proxy variable that will best represent trade openness is difficult. There will be a case of incomplete information if we randomly pick one variable and drop others. So, for this data set, we need to check the overall correlation structure of the data using Kaiser – Meyer – Olkein test to check if the data set is worthy of doing Principle Component Analysis (PCA). We are unable to combine all three trade openness metrics into a single time series model. Because the principal component technique captures the utility of each indicator, we build the Trade Openness Index by taking into account the weights of each variable. Pearson used the phrase "Principle Component Method" (PCM) for the first time in 1901. PCM is a multivariate method for investigating the connections between several quantitative variables. The eigenvalues of the principal component, whose values are equal to the variance of the components, are initially ordered in descending order. It has to be identified that the length of eigen vectors is equivalent to one. The first component has the biggest of any unit length linear association of the relevant variables, and likewise for the last element.

The PCM can be shown as:

$$W_j = a_{j1}M_1 + a_{j2}M_2 + \dots + a_{jn}M_n + d_jZ_j \dots \dots \dots (1)$$

Here, the observed variables in this case ranges 1 to n , and W is represented as linear in terms of n additional uncorrelated components $M_1, M_2 \dots \dots M_n$ which is actually the linear composition of the n inputs. The coefficient a_{ij} is represented as the weight of the regression on the i -th factor whereas Z_i is the unique factor which is affected by idiosyncratic factors. The critical issue here is to obtain the best linear combination. The first principle component's eigen value displays 99.1% of the variation, while the subsequent principal component displays 0.8% and the final principal component displays 0.0% scaled variables.

The Principal Component Analysis is shown below.

TABLE 1 : PRINCIPAL COMPONENT ANALYSIS

Eigenvalues: (Sum = 3, Average = 1)				
Numbers	Value	Difference	Proportion	Cumulative Value
1	2.975469	2.950938	0.9918	2.975469
2	0.024531	0.024531	0.0082	3
3	0.05E-16	-	0	3

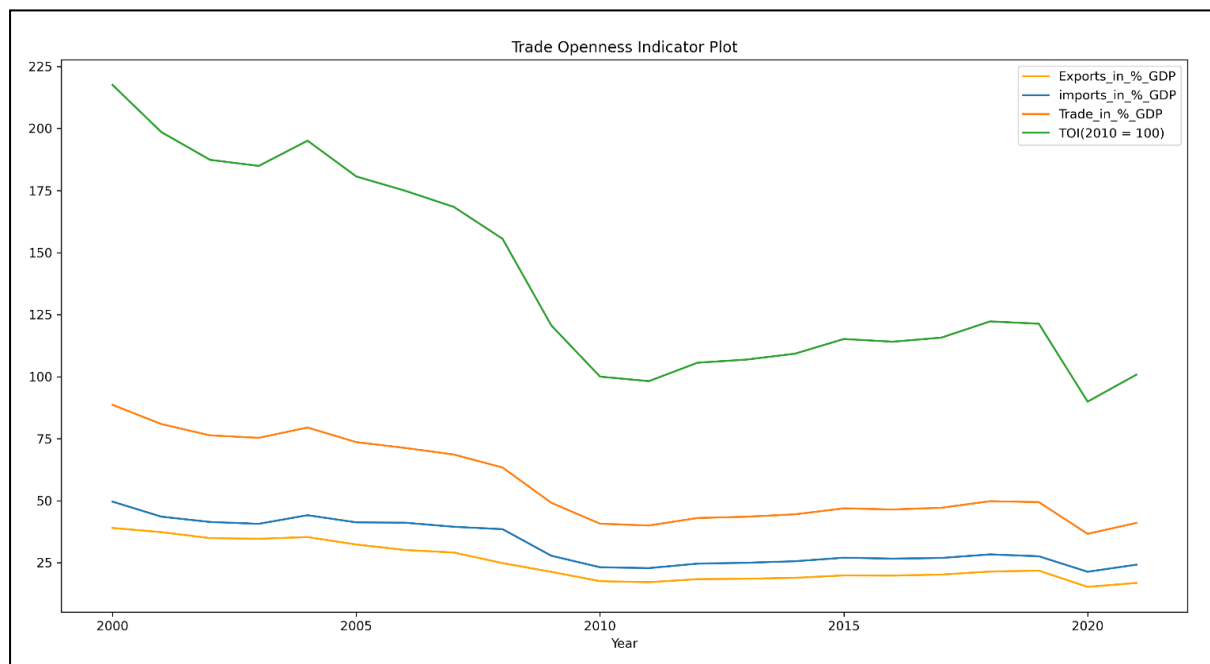
Eigenvectors (loadings):			
Variables	PC 1	PC 2	PC 3
(X+M)Y	0.579719	-0.0308	-0.814234
M/Y	0.576321	-0.690907	0.436464
X/Y	0.576004	0.722287	0.382781

Ordinary correlations:			
	(X+M)/Y	M/Y	X/Y
(X+M)/y	1		
M/Y	0.994638	1	
X/Y	0.993023	0.975504	1

Source: Author's Findings.

Therefore, it can be demonstrated that the first main component is superior to \alternative combinations of variables because it illustrates the extreme degree of variety. As a result, we will take the weight the first eigen vector results to create the TOI, or measure of trade openness. The standardized variance of the first principal component that is the summation of export and import as a share of GDP; export as a share of GDP and import as a share of GDP is 58%, 57.6% and 57.6% respectively. We see that export in terms of GDP and import in terms of GDP runs very close to each other. Above all other metrics is the trade openness index.

Figure 1 : Trade Openness Indicator Plot.



The trade openness index (TOI), export as a share of GDP, import as a share of GDP and trade as a share of GDP was highest in the year of 2000 and since then it kept on falling. The TOI fell drastically from the year of 2000 to 2010, after this period it slightly rose till 2019 and after which it fell again mainly due to the financial crisis that happened due to the bomb attack and COVID-19 pandemic. We see that the TOI has again started rising in 2021. We notice that export in terms of GDP is the lower than import in terms of GDP even though there is little difference. The major difference between export in terms of trade and import in terms of trade has been seen from 2005 to 2010 after which, both the curves ran almost parallel to each other,

and both of them fell together from 2019 and hit the lowest point in 2020 and again started rising in 2021.

Utilising Lucas' (1988) production function, which presents trade openness as a distinct factor input with other input variables like physical capital and human capital, the present empirical study explores the relationship between trade openness and growth in the economy.

$$Y = F(K, HC, TOI) \dots \dots \dots (2)$$

We take log linear of the function (2)

$$Ln(Y_t) = \theta_0 + \theta_1 Ln(K_t) + \theta_2 Ln(HC_t) + \theta_3 Ln(TOI_t) + \varepsilon_t \dots \dots \dots (3)$$

Where,

Y = Real GDP of the country, K = Physical Capital, HC = Human Capital, TOI = Trade Openness Index. The natural logarithms are represented by Ln , the coefficient for the slope of the relevant variables by the θ_s , the ε_i is the error correction elements and t represents the period i.e., 2000 to 2021.

To determine the long-term link between trade openness and the growth of the economy, we will put the Autoregressive Distributed Lag (ARDL) technique to cointegration to the test. The following error correction model is estimated in the ARDL method of cointegration

$$\begin{aligned} \Delta Ln(Y_t) = & \lambda_0 + \sum_{i=1}^{\rho} \lambda_i \Delta Ln(Y_{t-i}) + \sum_{i=0}^{\rho} \lambda_i \Delta Ln(HC_{t-i}) + \sum_{i=0}^{\rho} \lambda_i \Delta Ln(K_{t-i}) \\ & + \sum_{i=0}^{\rho} \lambda_i \Delta Ln(TOI_{t-i}) \end{aligned}$$

$$+ \alpha_1 Ln(Y_{t-1}) + \alpha_2 Ln(K_{t-1}) + \alpha_3 Ln(HC_{t-1}) + \alpha_4 Ln(TOI_{t-1}) + \psi_t \dots \dots \dots (4)$$

Where,

Y_t = Real GDP of the country, K_t = Physical Capital, HC_t = Human Capital, TOI_t = Trade Openness Index. The different operator is denoted as Δ , whereas ρ is the optimum lag and ψ is the error term. The presence of the long run relationship among the variables is tested using F-test statistics. For equation (4), the null hypothesis of the no cointegration is that

$< H_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0 >$, and the alternate hypothesis is

$< H_1 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 \neq 0 >$. Therefore, in this way we will decide the long run relationship, if the F-test that we computed exceeds the upper critical bound value, then null hypothesis (H_0) is rejected and if F- test is within the bounds, then the test is inconclusive. But if the F-test that we computed is below the lower critical bound value, it shows no cointegration. The rolling window regression technique is also used in this study to check the coefficients' consistency across the whole sample period. The key benefit of this approach is that, by controlling window size, it can calculate the coefficient of each observation over the sample. In contrast, the other cointegration methods that are currently in use assume that the

coefficients' parameters are constant throughout the sample. But in practise, because of changes in the economy, the coefficients cannot stay the same.

5. FINDINGS

5.1 ARDL MODELLING APPROACH

The Augmented Dickey Fuller (ADF) is used in this study to measure the degree of integration. All variables are integrated in order one, according to the findings of the ADF test. The study then uses the autoregressive distributed lag model to investigate the long-term association after looking at the degree of integration. The three alternative scenarios— with unrestricted intercept and no trend (FIII); with unrestricted intercept and restricted trend (FIV); and with unrestricted intercept and trend (FIV)—are used to examine the long-term association. Table 5 displays the long-term relationship's outcome. The findings show that the long-term association holds true for all four models (whether we use each proxy alone or as part of a composite trade openness index). The Schwarz information criterion is used in this study to choose the best lags. In the following phase, we estimate the log run coefficients after determining the long run relationship. Results of long run coefficients are displayed in Table 6. The findings show that trade openness influences economic growth positively in the case of Sri Lanka, with a 1% increase in Ln (X/Y) is increasing real GDP by 1.054%, a 1% increase in Ln (M/Y) is increasing real GDP by 0.887%, a 1% increase in Ln (X+M /Y) is increasing real GDP by 0.875%, and a 1% increase in trade openness index is increasing real GDP by 0.885%. Table 7 presents the short run coefficients. In all four instances, trade openness is a strong predictor of economic growth. Physical capital has a short-term positive relationship with economic growth while human capital does not have a statistically meaningful relationship. The rate at which a system transitions from short-run disequilibrium to long-term equilibrium serves as a proxy for the correction terms. In all four instances, the error correction term is statistically significant and negative (according to expectation). The long-term relationship is thus confirmed.

TABLE 3: RESULTS OF UNIT ROOT TEST

Variables	ADF					
	None		Constant and Trend		Constant	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Y	-0.106	-4.194**	-3.101	-4.279**	0.802	-3.473*
HC	-0.617	-3.486**	-2.245	-3.791*	-1.175	-2.751*
K	-1.098	-4.093**	-1.025	-3.061*	-1.043	-3.526*
X/Y	-2.299	-3.171*	-1.386	-4.882**	-1.445	-4.722**
M/Y	-1.329	-3.932**	-2.213	-4.042*	-2.232	-3.795**
(X+M)/Y	-2.391	-3.328*	-1.645	-4.201*	-1.584	-3.934**
TOI	-2.391	-3.327*	-1.635	-4.301*	-1.784	-4.067**

Source: Author's Findings.

Note: None means no intercept and trend. (**) means 1% Significance level and (*) means 5% Significance level.

TABLE 4: CRITICAL VALUES FOR ARDL MODEL APPROACHING

K=3						
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F_{III}	2.933	4.02	3.548	4.803	5.018	6.61
F_{IV}	3.264	4.094	3.85	4.782	5.258	6.526
F_V	3.76	4.795	4.51	5.643	6.238	7.74
t_V	-2.57	-3.46	2.86	-3.78	-3.43	-4.37
t_{III}	-3.13	-3.84	-3.41	-4.16	-3.96	-4.73

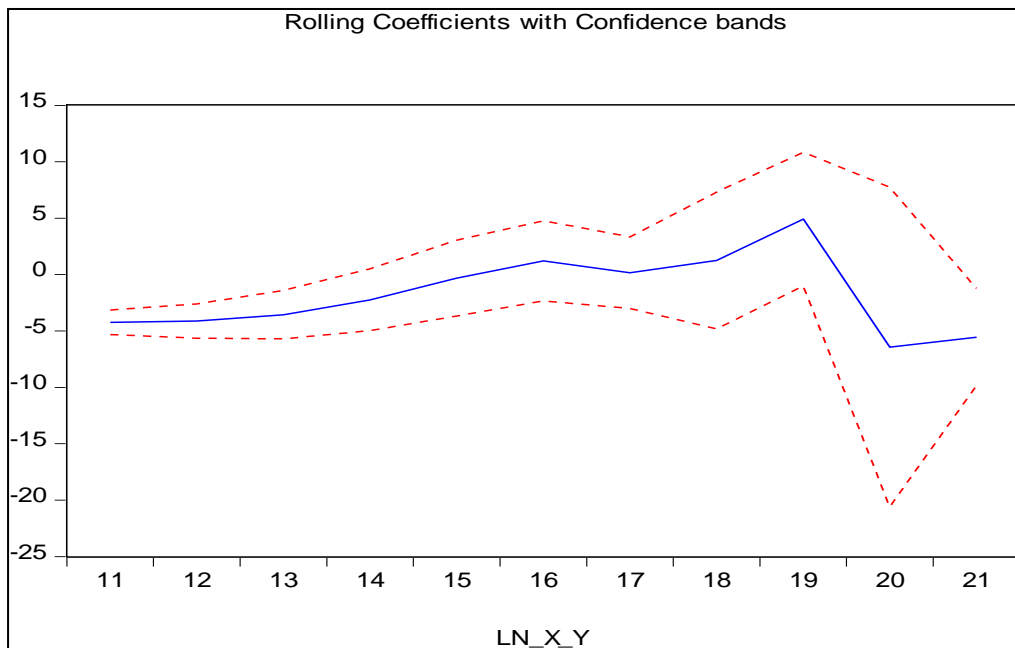
Source: Author's Findings.

Note: K = numbers of regressors, F_{iii} = F- statistics of the model with unrestricted intercept and no trend. F_{iv} = F- statistics of the model with unrestricted intercept and restricted trend. F_v = F- statistics of the model with unrestricted intercept and trend. The t_{iii} , t_v = t ratio for testing α in equation 3 with and without deterministic linear trend.

5.2 ROLLING WINDOW RESULTS

The figures 2, 3, 4, and 5 shows the results of Rolling Window regression. The dotted lines of upper band and the lower band are the two standard deviation bands which states that the coefficients are statistically significant.

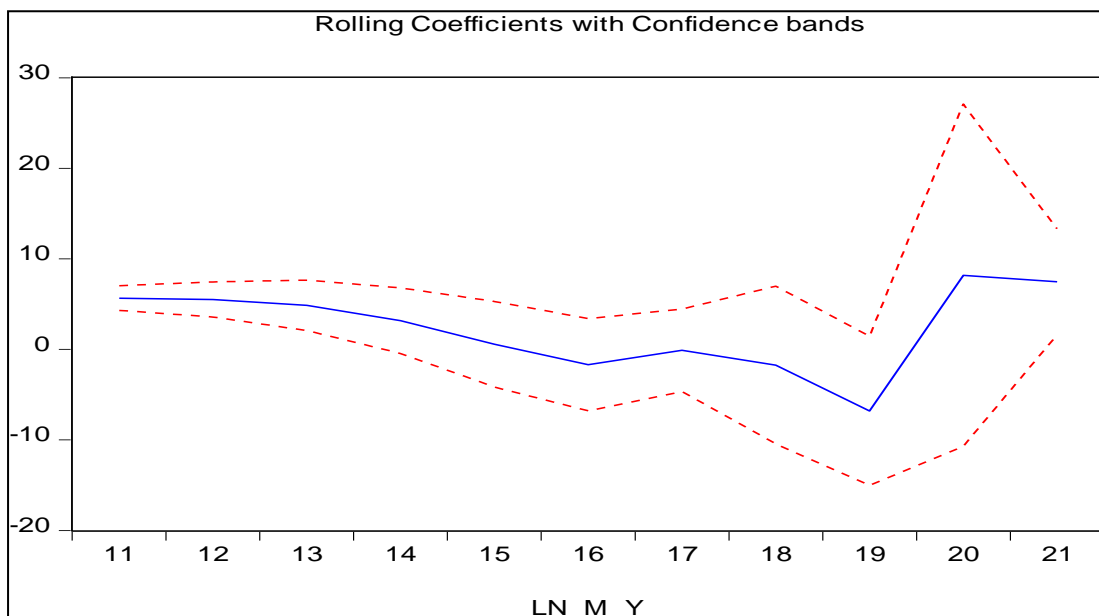
Figure 2: Rolling Window Results of Ln(X/Y)



Source: Author's Findings.

The dependent variable is taken as Ln(Y) and the coefficient of Ln(X/Y) is found based on rolling OLS; Total number of regressors taken are 4. The export coefficients graph is shown in Figure 2. It is shown that export is negatively correlated with growth from the beginning. It started rising in 2015 and fell again in 2020 drastically.

Figure 3: Rolling Window Results of Ln (M/Y)

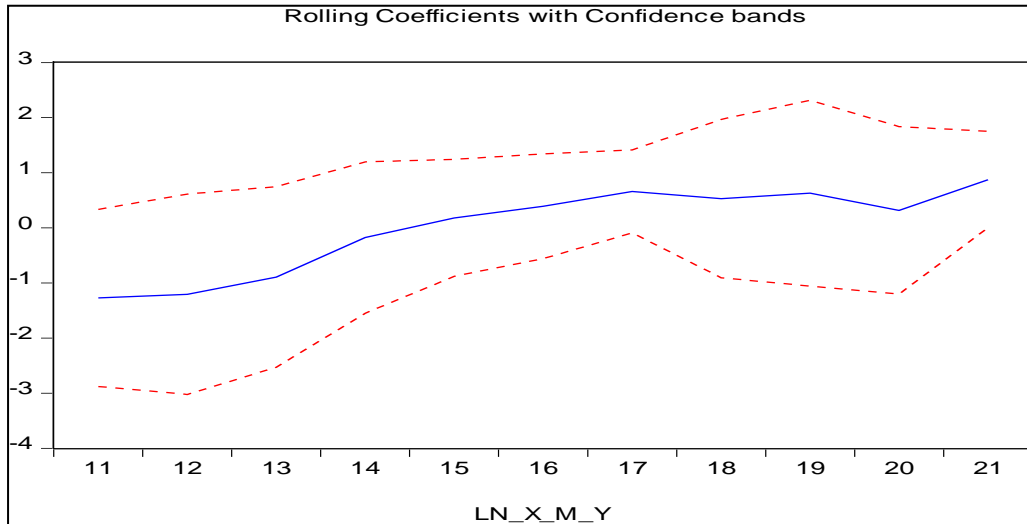


Source: Author's Findings.

The dependent variable is taken as Ln(Y) and the coefficient of Ln(M/Y) is found based on rolling OLS; total number of regressors taken are 4. The import coefficients graph is shown in

Figure 3. It is shown that import is positively correlated with growth from the beginning. But it fell excessively from 2005 and in 2019 it was at its lowest point; import was negatively correlated with growth. Soon after that it is seen that the curve started rising again.

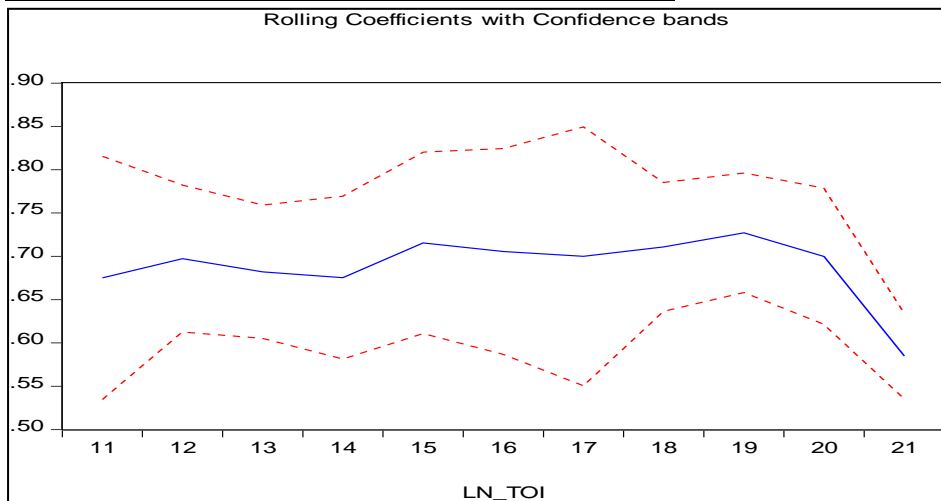
Figure 4: Rolling Window Results of Ln(X+M/Y)



Source: Author’s Findings

The dependent variable is taken as Ln(Y) and the coefficient of Ln(X+M/Y) is found based on rolling OLS; Total number of regressors taken are 4. The (X+M/Y) coefficients graph is shown in Figure 4. It is shown that (X+M/Y) is negatively correlated with growth from beginning. But it started rising from 2014 and was positively correlated with growth after that.

Figure 5: Rolling Window Results of Ln(X+M/Y)



Source: Author’s Findings.

The dependent variable is taken as Ln(Y) and the coefficient of Ln (TOI) is found based on rolling OLS; Total number of regressors taken are 4. The trade openness index’s graph has been uneven all throughout. The curve started rising initially but it fell in 2014 and again rose to a height in 2015 but fell drastically from 2019 during the times of bomb blast and COVID-19 pandemic.

6. CONCLUSION

This empirical study shows us that Trade openness i.e. (import plus export divided by GDP) is positively correlated with the economic growth in both long run and short run using the framework of endogenous economic growth model. The autoregressive distributed lag (ARDL) cointegration technique and rolling regression methods are used here. We have also taken other variables like physical capital and human capital and they both are also positively related to economic growth in the long run. We found that physical capital i.e gross fixed capital formation is also directly related with economic growth. It is advised that the following policy implication can be made based on the empirical findings. The positive coefficient of trade openness indicates that openness to all forms of commerce is essential for long-term economic expansion. The rolling window shows us that trade openness is generally negatively related to economic growth in the recent years except $\ln(X/Y)$ which seems to rise. The long-term positive and substantial coefficient of human capital shows that increasing education spending will boost economic growth. The significance of rising levels of investment in Sri Lanka is represented by the positive physical capital coefficient.

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APPENDIX

TABLE 1: SHARE OF FOREIGN TRADE IN GDP AND TOI

Year	Exports_in_%_GDP	imports_in_%_GDP	Trade_in_%_GDP	TOI(2010 = 100)
2000	39.01570089	49.62074082	88.6364417	217.5775397
2001	37.33118848	43.56741306	80.89860153	198.582158
2002	34.9133302	41.42180158	76.33513178	187.3803987
2003	34.65350283	40.6827445	75.33624733	184.9282971
2004	35.33090273	44.15204217	79.4829449	195.108047
2005	32.33687299	41.26709997	73.60397296	180.6770978
2006	30.12852709	41.13265139	71.26117849	174.9269892
2007	29.11499969	39.49151197	68.60651166	168.4104242
2008	24.8414871	38.52755651	63.36904361	155.555239
2009	21.32836624	27.82077529	49.14914153	120.6475278
2010	17.56527415	23.17248901	40.73776316	100
2011	17.16103293	22.83544232	39.99647525	98.18039915
2012	18.38927509	24.63699472	43.02626981	105.6177638
2013	18.54828672	24.9873109	43.53559763	106.8680643
2014	18.91449632	25.59682947	44.51132578	109.2632452
2015	19.89338382	27.02458699	46.91797081	115.1709362
2016	19.82403604	26.64750098	46.47153703	114.0749811

2017	20.22420004	26.91620976	47.1404098	115.7168044
2018	21.44624861	28.36314814	49.80939675	122.2683851
2019	21.82353092	27.60199296	49.42552389	121.3257171
2020	15.26841279	21.3666738	36.63508659	89.92941349
2021	16.85111399	24.20755294	41.05866694	100.7883049

Source: World Development Indicator and Author's Findings.

TABLE 5: BOUND TESTING ANALYSIS

Variables	Without Deterministic trend			With Deterministic trend			Conclusion H_0
	Lags	F_{III}	t_{III}	F_{IV}	F_V	t_V	
Y=F[K, HC, (X/Y)]	1	2.686***	-1.984***	-	-	-	Rejected
	2	0.181***	-0.511***	2.702***	3.321***	-3.578*	
	3	2.589***	-2.34**	2.594***	3.088***	-1.751***	
	4	14.117*	-5.902*	14.232*	17.025*	-2.961**	
Y=F[K, HC, (M/Y)]	1	4.301*	-2.255***	5.689*	4.572**	-3.063**	Rejected
	2	0.351***	-0.797***	1.821***	2.176***	-2.818**	
	3	1.773***	-2.082***	2.499***	2.905***	-2.382**	
	4	2.139***	-2.452***	5.549*	6.231*	-3.905*	
Y=F[K, HC, (X+M)/Y]	1	3.905**	-2.276***	2.169***	2.682***	-3.119**	Rejected
	2	0.322***	-0.761***	2.734***	3.241***	-1.831***	
	3	2.729***	-2.527***	9.534*	11.041-	-3.683*	
	4	6.703*	-4.351*	6.008*	4.788**	-1.889***	
Y=F[K, HC, TOI]	1	3.905**	-2.276***	2.169***	2.628***	-3.119**	Rejected
	2	0.322***	-0.761***	2.734***	3.241***	-1.831***	
	3	2.729***	-2.527***	9.534*	11.041*	-3.682*	
	4	6.703*	-4.351*	6.008*	4.788**	-1.888***	

Note: H_0 shows cointegration, (*) shows that the statistic lies above the 0.10 upper bound, (**) shows that the statistic lies within the 0.10 bound, (***) shows that the statistic lies lower the 0.10 lower bound.

Source: Author's Findings.

TABLE 6: LONG RUN COEFFICIENT

	Model 1	Model 2	Model 3	Model 4
Ln(HC)	0.605***	1.071**	0.974***	0.904***
Ln(K)	0.654**	0.832*	0.805**	0.805**
Ln(X/Y)	1.054**	No	No	No
Ln(M/Y)	No	0.887**	No	No
Ln((X+M)/Y)	No	No	0.875**	No
Ln(TOI)	No	No	No	0.885**
Constant	5.8251	-0.217	0.156	-0.581

Note: (*) shows 1% level of significance, (**) shows 5% level of significance, (***) shows 10% level of significance.

Source: Author's Findings.

TABLE 7: SHORT RUN COEFFICIENT

	Model 1	Model 2	Model 3	Model 4
Ln(HC)	-0.081	-0.023	-0.059	-0.0559
Ln(K)	0.037**	0.045***	0.048***	0.047***
Ln(X/Y)	0.059***	No	No	No
Ln(M/Y)	No	0.112***	No	No
Ln(X+M/Y)	No	No	0.119***	No
Ln(TOI)	No	No	No	0.129***
ecm_{t-1}	-0.056***	-0.055***	-0.059***	-0.058***

Note: (**) shows 5% level of significance, (***) shows 10% level of significance.

Source: Author's Findings.

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POLITICS OF ECONOMY: ESCALATION OF THE GLOBAL CLIMATE CHANGE

Sneha Roy*

Abstract

Escalation of Global Climate Change is the most challenging concern today. Our Earth has faced the temperature rise from last few decades since 1880. The day by day increased in GHG & Carbon emission is the main cause behind that. Burning of around 20.28 million barrels of Fossil fuels on daily basis which is necessary for industrial activities, can produce the Green House Gases and enhanced Global Warming. Fossil fuels helps \$5.9 trillion or 6.8 percent of GDP of world economy as per 2020 and these are expected to raise to 7.4 percent in 2025 as the share of fuel consumption in emerging markets continues to climb. The World organisations tried to reduce the excessive use of Fossil fuels to curtail the rate of Climate Change. Establishing of some policies and protocols (e.g. Montreal Protocol, Kyoto Protocol, etc.) against the use of fossil fuels they tries to cool and make balance in our environment. But some countries didn't wants to follow these policies paying more attention to economic damage rather than environmental issues.

The Kyoto and Montreal protocol gave us the solutions to reduce the emission of GHG and Carbon. They convey to all countries to take a unite step against the climate Change. But some of them are not accepted those policies just because of the misconception of economic disaster. According to some notable scientists these are not affects in economy, hence it would help to get free our planet from this curse for long-term benefit.

Keywords: Climate Change, Global Warming, Policies and Politics, Politics of Economy, Economic damages on climate change, Global Temperature rise, Political issues on climate change.

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1. Introduction

Climate change is one of the major Global issues of the world's environmental and economic scenario. Our planet's climate has changed throughout history alternating between ice ages and warmer periods. Earth has faced at least five major ice ages with a last one ending nearly 12,000 years ago. Earth's temperature has risen by an average of 0.14° Fahrenheit (0.08° Celsius) per decade since 1880, or about 2° F in total (Climate.gov; Rebecca Lindsey et al., 2023). Human activities such as burning of fossil fuels, cutting down of forests, and the decomposition of waste in landfills leads to excess emissions of greenhouse gasses and currently global temperatures have risen by **1.1 degrees Celsius** above pre-industrial levels, that's a lot on a climatic scale and this is not equally emitted by all. This effect is known as **'Global Warming'**.

Increased temperatures causing the melting of ice in the Arctic regions as well as glaciers and snow melts around the world. These puts small islands in danger of disappearing and influenced the sea level rise causing devastating floods in many countries like China, Indonesia, Philippines, Malaysia and Thailand. It destroys the livelihood and economy of the country.

These floods are not only a direct hazard to humans but can also destroy crops and farms used to feed the population. It also make weather more extreme bringing severe storms, longer droughts and heat waves. The loss of soil moistures and the high temperatures during a drought increase the risk of wildfires too and also temperatures both on land and oceans affect earth's delicate ecosystems. Temperature rise also poses the risk to loss in species diversity.

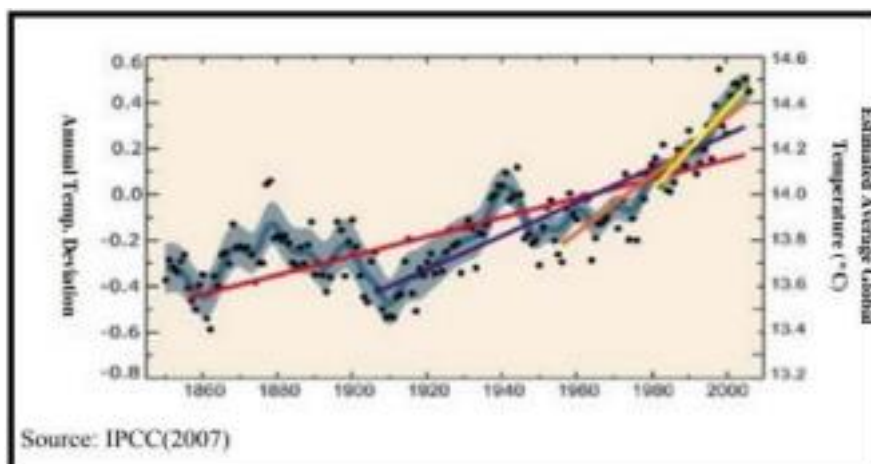


Fig 1: Average Global Temperature and Climate Change

These graphs shows the average global temperature and climate change which is provided by IPCC (Intergovernmental Panel on Climate Change) in 2007. In this graph it is observed that during the year 1880 to 2000 the average global temperature and the annual temperature is gradually increasing day by day at a very high rate.

2. Objectives

Climate Change is a worldwide global issue nowadays. Adaptation of different policies and mitigation techniques by international organizations helps in lessening climate change. So, it is our main concern to lower the environmental and economic damages, pare risk and vulnerability to climate change. Through this paper we are trying to analyse the effectiveness of different protocols taken by the world's agencies and how much climate change affects our social and economic livelihood. And also the political conflicts created by the governments of

major countries of the world for the reduction of carbon emission and decrease in fossil fuels burning can lead to major loss in the industrial economy.

3. Methods

- **Study Protocol:** The present review was carried out following the Preferred Reporting items for a Paper Review and it's critical analysis.
- **Search Strategy:** A comprehensive literature search was conducted in Google Scholar, Research gate, IPCC Reports, Springer Science direct. Specific terms and keywords are used while searching those databases. The following search terms are used: Climate Change, Global Warming, Economic Damages in Climate Change, Fossil fuels emission etc. Here I tried to find out the environmental, economic and political problems regarding Climate Change and the remedies. And then finally, to focus the interrelationship between the policies and politics and how it effects on climate change and related dichotomies, search was made with very specific keywords such as 'Climate Change', 'Global Warming' and 'Politics on Economy'. The review study has been aimed to understand and critically analysed the distortion in global economy through climate change and also the political issues regarding these environmental changes and the policies to get rid of these problems. The search strategy includes Keywords, and some weather forecast related websites. There was no limit on language, type of publication, study design.
- **Eligibility Criteria:** After searching in different databases, a lot of papers were primarily enlisted and relevance publications are chosen removing the duplicate ones. Then rest of the papers were evaluated based on the title and abstract. The full papers were screened thoroughly according to the inclusion and exclusion criteria and few have been finalised for study. The inclusion criteria applied were-
 - The paper must be original article
 - Must be published in English language
 - The papers must contain some keywords like – Climate Change, Global Warming, Politics on Economy
 - Paper should be include analytical critical study design
 - The paper should describe the global economic prom through climate change the politics based on it

→ Paper must be appropriate control group

In contrast, the exclusion criteria applied were-

→ The review paper were not under study

→ The paper is not presented in English language

→ There is a contradiction of specific parameters

→ Abstract only articles or conference articles

- **Data Collection, Synthesis and Extraction:** After screening all publications according to their exclusion and inclusion criteria collection of data, synthesis and extraction was performed. Incompatibility was resolved through discussion and consensus was reached. Data extraction was performed via first author's last name, year of publication, study design, studied economic data in financial year, duration of study, control group etc.

4. Analysis

➤ **The IPCC Findings:**

The **IPCC (Intergovernmental Panel on Climate Change)** report had described India as one of the most vulnerable countries. According to the assessment several big cities of the world are at risk. More than 3.5 billion people or 45 percent of total global population are now at a high risk zone of heat waves. They may not tolerate if the heat wave became increased. The report stated that the damage to Mumbai from the sea level rise could be up to **162 billion dollars** a year by 2050. India's country level social cost of carbon emission was estimated to be the highest at 86 dollars per ton of CO₂ which means the Indian economy would loss that amount by emitting each additional ton of CO₂. India is followed by the US and Saudi Arabia where the economic damages would be 48 and 47 dollars respectively per ton of CO₂ emission. In south India maize production could fall by 17 percent if emissions are high and these fall could cause price spikes and threaten food affordability, quality and economic growth. These reports describes the increased in flooding at Ganga and Brahmaputra river basins due to climate change and which will cause decline in fisheries and agriculture. Countries build policy responses to cope up with the changing climate on the basis of findings of reports. The panel has now clearly said that if the temperature rise sold past the **1.54 degree Celsius** threshold from the pre-industrial times several changes could be inevitable. According to it **2 degree Celsius** target could be disastrous. So, the government's world over should ensure that lack of funds and political commitment should not come in the way of keeping the global mercury in check. The IPCC finds that there is a more than 50% probability that global temperature rise will reach or surpass **1.5 degrees C (2.7 degrees F)** between 2021 and 2040.

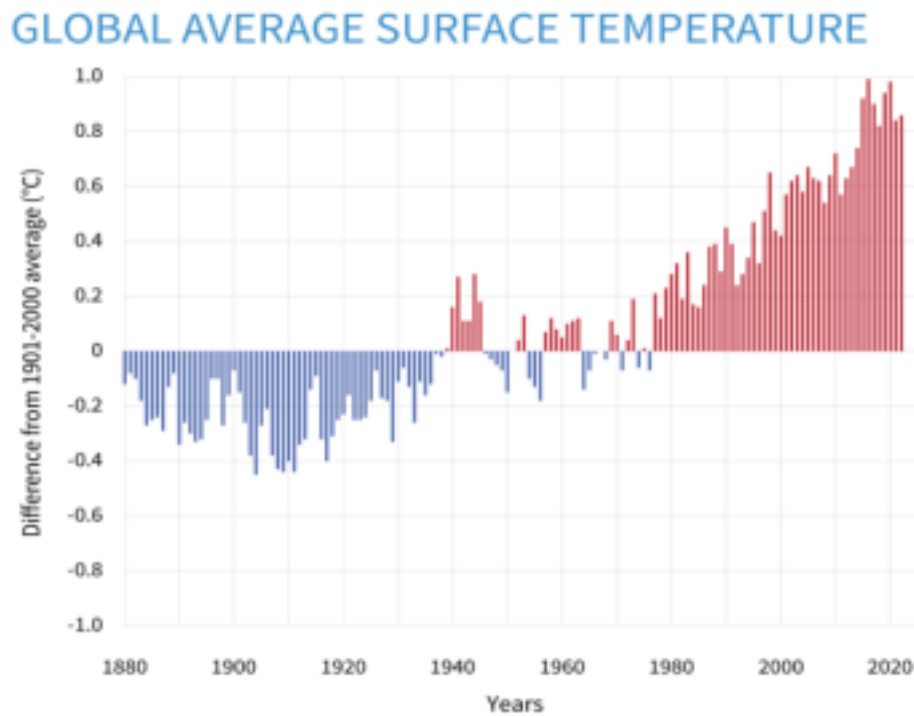


Fig 2: Climate Change: Global Temperature

Yearly surface temperature compared to the 20th-century average from 1880–2022. Blue bars indicate cooler-than-average years; red bars show warmer-than-average years. NOAA Climate.gov graph, based on data from the National Centres for Environmental Information.

Based on the findings of IPCC and other reports almost 100 Countries have agreed to build policies for reducing GHG emission and tackling climate change. In Spite of thinking about the damages to the ecosystem some countries are focussing on the reduction in fossil fuels uses, which will place a large burden on industry and economy. Thus, carbon politics has emerged, and the dichotomy started. But according to some notable economists these economic disasters are unscientific and the reduction of GHG emission will give us long term economic benefit.

To establish their point of view the IPCC envisaged some crucial points through the publishing of **AR6 report**. According to them, the climate change caused by the anthropogenic works of people is already affecting many climatic extremes in several regions throughout the world, along with the widespread loss and damages both the environment and the livelihoods of people. The IPCC has very high level of confidence that the risk and negative impact of Climate change escalate the Global Warming. To keep within the 15°C limit, the emissions need to be minimized at least 43% by 2030 which is compared to 2019 levels and at least 60% by 2035. This is the decisive decade to make that happen. These losses are generally affects to the developing and underdeveloped countries and the poorest and the most vulnerable populations of them. For example, these affects basically the poor African and Asian countries.

These reports convey us to minimize the use of GHG emissions at international level and decrease in the amount of burning of fossil fuels which may be affects the global economic and industrial sectors, but it will return us the GHG free environment in the long-term output.

Analysing these reports and papers a brief outline is made about the Global Problem of Climate Change and its alonging eco-political issues and their remedies. Though climate change has a heavy adverse effect in environmental conditions like increase in water level due to melting of glaciers and also the untimely outcome of El Nino provokes natural calamities like super cyclones, storm surges etc. Which disturbed the entire economic activities day by day.

5. Results

a) Effects in Agricultural Economy:

Climate change affects agriculture through changes in average temperatures, rainfall, and climate extremes (e.g., heat waves), changes in pests and diseases; changes in atmospheric CO₂ and ground level ozone concentrations; modifies the nutritional quality of some foods; and changes in sea level. Future climate change will likely negatively affect crop production in low latitude countries, while effects in northern latitudes may be positive or negative. Climate change will probably increase the risk of food insecurity for some vulnerable groups, such as the poor. Figure 3 illustrates the multiple impacts of global warming and climate disruption on agriculture.

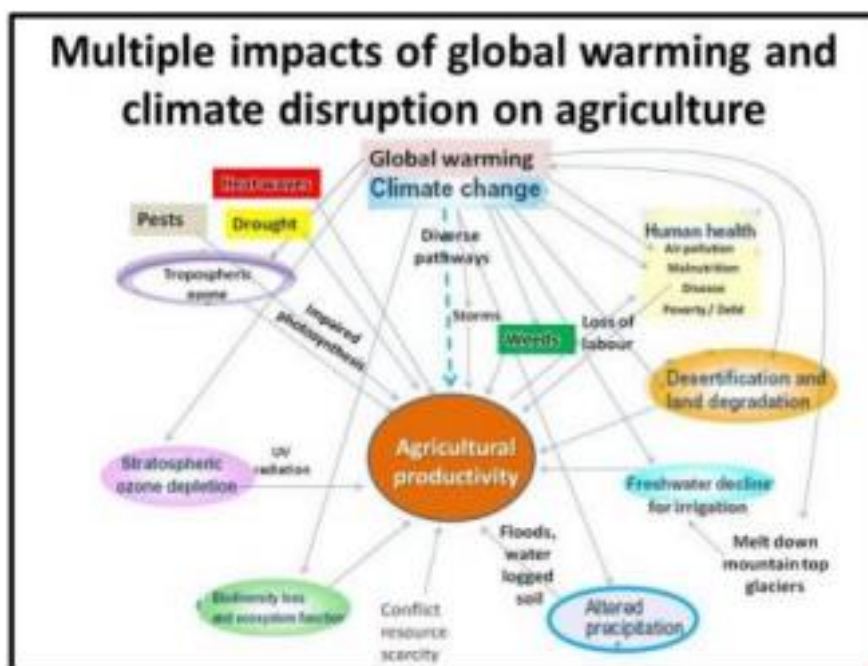


Fig 3: Impacts of Climate Change in Agriculture

- Many crops will benefit from increased atmospheric CO₂, concentrations and low and higher levels of warming will negatively affect growth and yields.
- Rising CO₂ concentration in the atmosphere is expected to have positive physiological effects by increasing the rate of photosynthesis known as carbon dioxide fertilization. But also higher CO₂ levels lead to reduce plant uptake of nitrogen resulting in crops with lower nutritional value. Which leads to the food crisis in poorer countries.

- Solar radiation, temperature, and precipitation are the main drivers of crop growth; and the agricultural work in developing countries like India mostly has always been dependent on climate patterns and variations. Hence, climate change is projected to have significant impacts on agricultural conditions, food supply, and food security. Some of these effects are biophysical, some are ecological, and some are economic, including: shifting in climatic and agricultural zones towards the poles; alteration in production patterns due to higher temperatures; the agricultural productivity has boost due to increased carbon dioxide in the atmosphere and deviation in precipitation patterns; and the poor people who were vulnerable to their landless situation.
- Agriculture is responsible for 87% of the total water used globally. In Asia it accounts for 86% of total annual water withdrawal, compared with 49% in North and Central America and 38% in Europe. Rice growing is a heavy consumer of water as it takes 5000 litres of water to produce 1 kg of rice. m³/ha. Hence, the productivity, in terms of

quantity and quality of crops; agricultural practices, through changes of water use and agricultural inputs such as herbicides, insecticides, and fertilizers; environmental effects, in particular in relation of frequency and intensity of soil drainage (leading to nitrogen leaching), soil erosion, reduction of crop diversity; rural space, through the loss and gain of cultivated lands, land speculation, land renunciation, and hydraulic amenities; and adaptation, organisms may become more or less competitive, as well as humans may develop urgency to develop more competitive organisms, such as flood resistant or salt resistant varieties of rice are likely to be impacted.

- Diseases and insect pests are being benefitted from warming, and will require more attention in regard to pest and weed control.

b) Climate Change and Transportation:

- ❖ **Air Transport:** All phases of air travel are influenced by atmospheric conditions. The effects are felt at all levels of operation-from the construction of a landing strip to the trip enroute and the landing and take-off conditions. As air transport improved it became necessary to understand flying weather. Most air transportation problems are concerned with meteorological conditions which include such factors as icing, turbulence, and selection of optimum cruise altitude in relation to winds aloft. Icing refers to the formation of ice on lift-producing surfaces (e.g., wings, control surfaces, propellers) so that the smooth flow of air over such air foils is interrupted. This drag and reduces lift to modify the aircraft's flight capabilities. Icing occurs in clouds where air temperature ranges from slightly above freezing to about -20°C (-4°F) when super cooled water droplets exist in the cloud and they will freeze on contact with a surface. In cumuliform clouds, the droplets are larger in size forming clear ice and Stratiform clouds forming rime ice where droplets are much smaller. Clear ice is heavier, and thus it can be more hazardous than rime, although most structural ice is often a combination of the two forms. Turbulence is the irregular motion of air over short distances in the atmosphere.

Its effect can pass from a slight bumpiness to structural damage of an aircraft. Microburst is the most deadly in-flight wind events, a localized downburst from a cumulonimbus, or thunder cloud, with a surface damage diameter of 4 km (2.5 m) or less. During take-offs and landings there is very little space or time to recover because microburst are deadly in low altitudes. Between 1964 and 1985, there were 26 commercial aircraft accidents and 620 deaths attributed to microbursts. **Clear-air turbulence (CAT)**, which normally is not visible to pilots, poses a severe safety hazard because of the violent motions it induces and aircraft that experience CAT are usually flying at high speeds that will increase the potential for damage or injury. The probability of encountering **CAT** increases with increasing altitude, being most typical at 9 to 13 km (6 to 8 mi). These abrupt changes often occur near the boundaries of jet streams, so **CAT** experience there which is just the ramification of climate change. Air transport also is plagued by the problem of fog which is the advection process of Diabetic condition of wind which is mostly provoked by climate change. Such a problem is shared by other forms of transportation, such as highway, rail, and marine transport.

- ❖ **Shipping:** The struggle between people and the sea is an age old one described in literature by many famous writers. Given that most of the problems faced by mariners are related to atmospheric conditions. The expansion of the infamous fogs in the Newfoundland Banks, for instance, is related to the movement of warm air of the North Atlantic Drift and its sudden chilling passes over the colder waters of the Labrador Current. Violent storms at sea are a hazard facing shipping. Probably the most dangerous storms are hurricanes, originating over the warm seas in low latitudes. Violent storms at sea are a hazard facing shipping. Probably the most dangerous storms are hurricanes originate over the warm seas in low latitudes. Deriving their energy from the oceans over which they originate, they soon dissipate once they pass over land. These is all by the El Nino effects sometimes and which is influenced by the climate change.
- ❖ **Land Transportation:** For most persons living in a mid-latitude climate, the significance of climate in relation to land transportation is usually quite clear. Roads covered by snow or ice, or obscured by fog or blowing dust, are events most people face at one time or another. The most problematic condition is when there is not uniform volume of ice, leading to extremely uneven surfaces which occurs when subgrade material varies, from sand to silt for example, where drains, culverts, or utility lines break the uniformity of the subgrade material. The quality of road transportation is also influenced by climate. The effect of freezing and thawing on roads is widespread, and most temperate regions experience some degree of frost. Frost action on pavements can cause frost heave and settlement that results in loss of compaction, rough surfaces, and deterioration of the surfacing material.

c) Effects in Industrial Economy:

Industrial activity can be considered in terms of primary, secondary, and tertiary industries. As we know that climate plays a vital role in agricultural economy which is under one of the main primary economic activities. The role of climate in another primary activity is the extractive

industry which is not so clear because many of Earth's resources are not readily affected by differing climates. A mineral or fossil fuel deposit may be the result of paleoclimatic events.

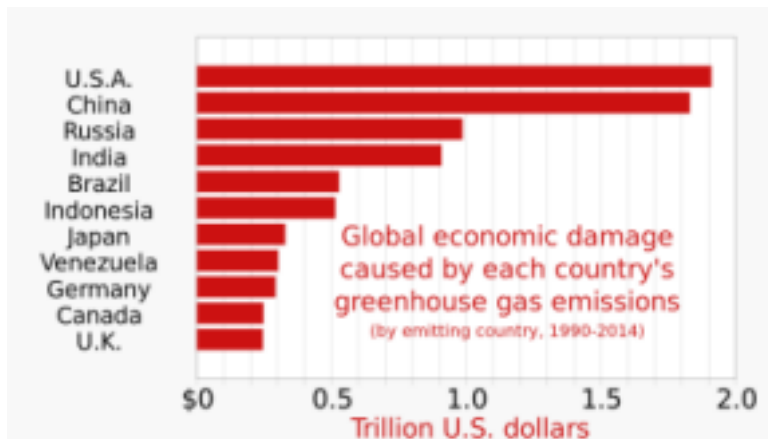


Fig 4: Global Economic Damage by GHG emission

- ❖ **Industrial Location:** The role of climate becomes visible in the secondary and tertiary activities. The industrial Location, historical influence, flexibility of raw materials, fossil fuels and power resources, labour supply, demand and the market considerations and also the transport facilities play the main role in the industrial economy which is directly related with the climate. Climate change miserably affected the industrial economy. For example the aircraft industry of Southern California needs mild winters and light winds and also the large hangers used for aircraft manufacture did not require excessive heat. But because of the changing climate the industry faced heat problems and also needed to pay the extra air-conditioning cooling cost. There is good reason for the treatment of some products away from their areas of production. For example, though West Africa is the major producer of cocoa, western European countries are among the main producers of chocolate and chocolate products. The hot, humid conditions of the growing areas would necessitate high-cost facilities to stop chocolate products from melting, and air-conditioned storage and ships would be required to stop its spoiling, which effects economy.
- ❖ **Energy Production:** It has already been noted that present day climate has little bearing on the location of fossil fuels. However, climate today does influence the location of hydroelectric power generation, solar energy production, and wind energy. Hydroelectric power production relies on a sustainable flow of water over a change in elevation. This feat is most often achieved by construction of dams to create large reservoirs and to fill it must need the supply of water through a precipitation source. Which is influenced by climate change.

d) Disruption in Tourism and Commerce:

The tertiary industries cover many sectors of the economic environment. The changing in temperature put its adverse effects in the tourism industry. Tourism provides near about

512 billion dollars to our **GDP**. But climate change became a barrier between our economic development and commercial practises.

- ❖ **Tourism:** Tourism is the world's fastest growing industry, and some economists have suggested that fairly soon it will become the largest industry in the world. In some locations, it is already the main source of national income. India earned **INR 1,34,543 crore** in 2022, against **INR 65,070 Crore** in 2021, according to government's provisional estimates from the tourism industry. Today, governments and individuals are taking notice of the carbon footprint they leave behind on Earth. In light of the increasing amount of incontrovertible evidence of climate change, people are becoming ever more concerned about contributing to this change and gradually more inquisitive about actions that will curtail carbon output.
- ❖ **Commerce:** Perhaps the most easily observed local impact of weather and climate on commerce is at the local mall or shopping centre. The overall regional climate determines the demand for the type of goods sold while weather conditions influence the day-to-day variations in spending. The change of seasons influences the types of clothings. Both good and bad weather can influence retail sales. The weather might actually prevent people from reaching stores, with snowfall being a good example. Similarly, those times when heat waves cause extensive discomfort can lead to extra time spent in shopping malls. As a result, less money is spent on shopping. Other commercial activities closely related to climate and weather is insurance, particularly that concerning agriculture for crops and livestock to assess risk.

➤ Generation of Heat Waves:

The GHG emission resulting the generation of Heat Waves which is one of the major problems throughout the World. Heat waves are more threatened when combined with high humidity. The combination of temperature and humidity is measured by the heat index. The tropical and the subtropical countries have faced mostly these problems. Asian countries are mainly go through with this situation. Our country India has been faced this heat waves issues for decade. Its affects our country adversely.

In the month of **Jan, 2023** there was a **cold wave** in the whole country and in **Feb, 2023** there was a **heat wave**. These February is the hottest one in the past 100 years. It is February itself the temperature is reaching 36 to 39 degrees, then **what will happen in future?**

As the **IMD (Indian Meteorological Department)** the heat wave is declared when the temperature when the temperature in plain areas is 5 degrees more than the main temperature or If the temperature crosses 35 degrees. In the coastal areas, if it is **5 degrees** more than the main temperature or if the temperature crosses 37 degrees. For example in Mumbai, in the month of February the average temperature is around **31 degrees**. But this year in the month of February, the temperature in Mumbai had reached **36 degrees**, which meant, for a few days a situation like heat wave had arrived. It is not like a season, it occurs on daily basis. In the last year too, in April and May there also a heat wave declared near Delhi.

Why do these heat waves occur?

Heat waves are formed when the high pressure created in the atmosphere of an area. Since the high pressure is created in the upper area winds are trapped towards the ground and heat reflected by ground gets trapped in this area. In this high pressure area outside wind is unable to enter and the wind inside is unable to leave like a close room the heat gets trapped at one place only.

According to **World Bank** the climate change is one of the main cause for generation of heat waves in India. The heat waves in India increased in 100 times. Our country is not currently ready for these situations. In 2022, the **16 states** of India have faced the **280 heat waves** which directly effects in our health.

Due to these heat waves and rising temperature the productivity became reduced. It affects in our agricultural work which contributes the one-third of our national GDP. **Mckinsey** states that, due to heat waves productivity of everyone goes down by **5 to 10 percent**, which means the labours get tired soon so the lesser in their capacity and that affect in our economy, up to **4.5%** of our **GDP**. That is, **126 billion dollars** every year.

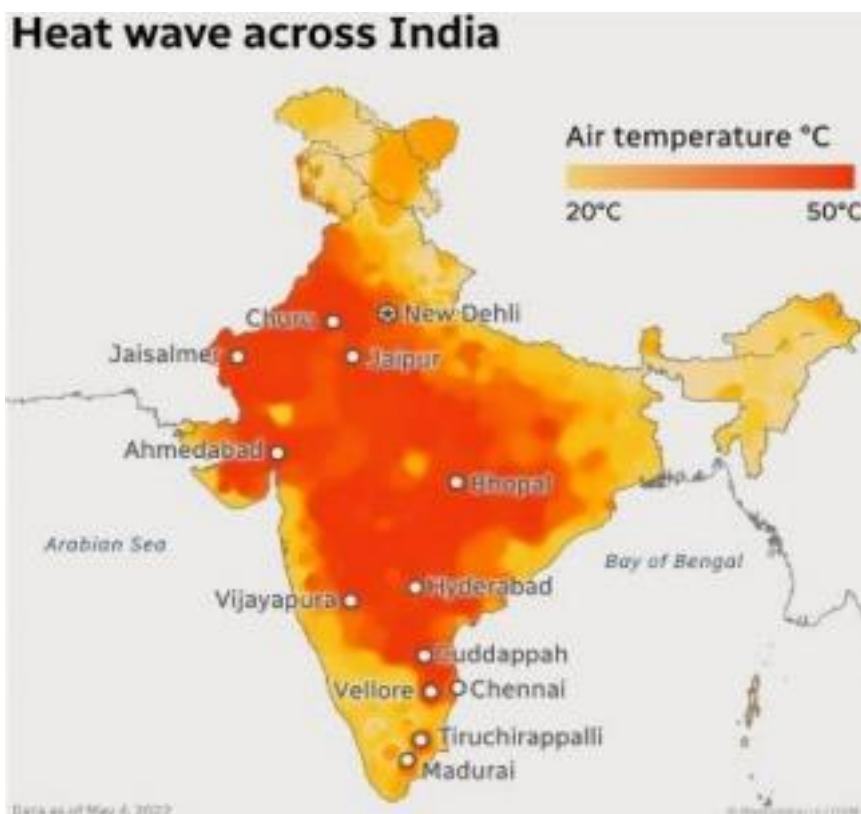


Fig 5: Heat waves across India

· Source: CBC News (May, 2022)

Heat waves and Economy:

When we talk about the heat waves our perspective are restricted to an individual level and our health. Heat and health have a connection with each other. In our country 70 crore people do a labour intensive, physical job which means their work is linked to their capabilities. This link is crucial for our country's economy. It affects in our economy by different sectors:

- a. Agriculture:** In India the agricultural activities are solely dependent upon the climatic factors and outdoor activities. The Wheat stands getting harvested in April-May. In 2022, the wheat production assumed to be **110 million tonnes** but it actually produced the amount of **103 million tonnes**. Which amount of wheat India wanted to export they didn't able to. Heat waves losses in crop production thoroughly. In India the crop production losses **9%**, mainly the cause behind that is heat waves that's why the labours wasn't able to do hard work. Increasing heat affects their health.
- b. Pharmaceuticals:** India became the world pharmacy. For the whole world our country manufactured the generic drugs. Every year the **20% losses** in medicine and medical equipment due to the climatic conditions of temperature rise. The economic input of medical losses is **313 million dollars**.
- c. Construction:** Construction sector provides the highest amount of Indian employments. But in this sector the employees had to work maximum times in outdoors in the heat. If people are not able to work outdoor in the heat, the projects can be delayed and faced losses. **ILO (International Labour Organization)** states that, by **2030** there can be **9%** productivity loss in construction too.
- d. Electricity Sector:** Heat waves touches electricity sector too. Increasing heat needed more power supply and also the artificial cooling machines. Using high amount of cooling machine like Air-conditioner, Cooler is one of the reasons of global warming, GHG emission and Heat waves. These machines emitted CFCs which helps in increasing temperature and leads to heat waves. It is a passive effect and this happens in cyclic manner.
- e. Disruption in Livelihood:** Not only heat waves effect our environmental and national economic sector, but also it leave a paw in our personal life in our wallet. Loss of productivity increases price hikes and also the temperature increase put forward people to more luxury form getting relief to heat. It became a major threat for common people. **Consumer Price Index (CPI)** measures the inflation. Punjab is the leading wheat producing state. Last year, the temperature in Punjab was **4-5 degrees** more than average which related the output by 5 million metric tonnes. Less output means higher price and which impacted our wallet. This not only for one crop, it totally effects in our crop production system. The Heat waves completely burns our pocket.

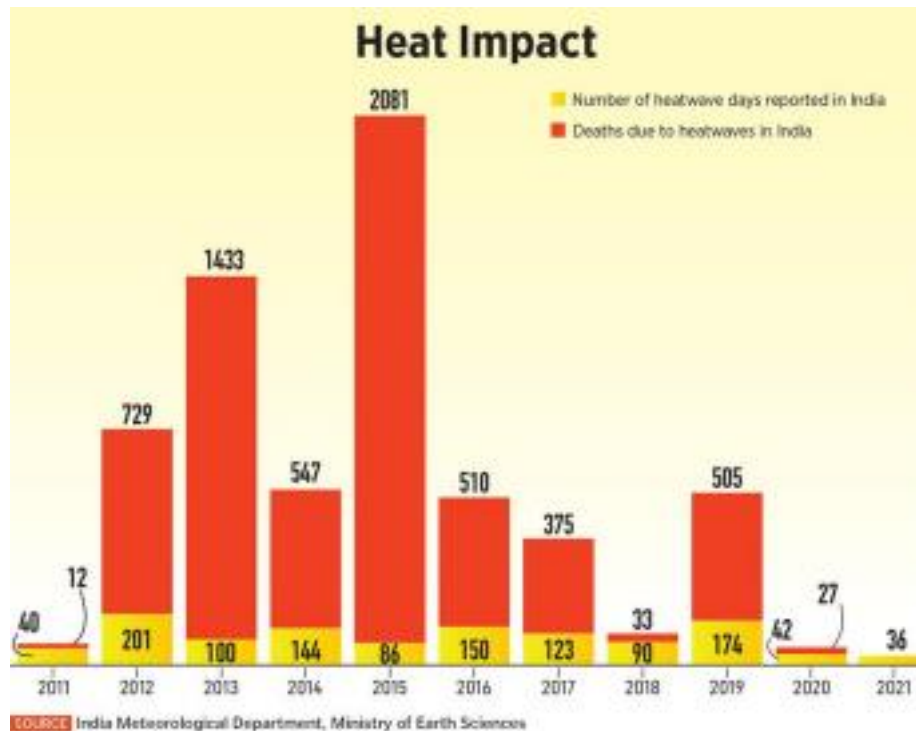


Fig 6: Heat Impact in India

· Source: IMD (May, 2022)

6. Discussions:

🌍 Global Climate Change and Its Impact on Indian Economy:

According to the **World Economic Forum's Global Risks Report 2020**, the top 5 risks over the coming decade in terms of likelihood, are all climate related including human-made environmental disasters, climate action failure natural disasters biodiversity loss and extreme weather. Developing economics like India are particularly vulnerable to the effects of climate change. Climate change has resulted in significant economic losses for India across sectors with heat waves, significant increase in the frequency of storms and shift in monsoonal trend etc. Let it be analysed how they are affecting Indian economy in various ways.

A. Significant increase in the frequency of storms:

Due to climate change severe anomalies in weather patterns have been found. The increase in the frequency of storms is one of the most highlighted problems now

a- days. To discuss the economic impact of cyclones let us consider the severe economic calamity regarding cyclone **Amphan**. The cyclone has occurred in the **Bay of Bengal** region and its impact was massively felt in the coastal states of **Odisha** and **West Bengal**. According to **Indian Meteorological Department**, Cyclone **Amphan** is a **category 2 cyclone**, which is a very severe cyclonic storm. The impact from this

magnitude is both short as well as long term. The impacts can be classified as several points:

- **Damage to Coastal Homes:** Whenever there is a cyclone, the coastal areas are the first place to get hit by the storm. The impact is immediately felt as homes are mostly built using local cheap materials like wood, wooden mats, mud or metal sheets. These building techniques can make thousands of people homeless if the cyclone is category 2 or higher.
- **Redistribution of Sand:** A cyclone is associated with storms, torrential rain and strong winds. Winds are the first thing to blow towards the landmass. The cyclone **Amphan**'s maximum wind speed went up to around **185 km** per hour. This kind of high wind velocity will move the sand from the deltaic region of West Bengal and Odisha along the direction of the wind. Sometimes the sand spreads over the agricultural fields of lower deltaic regions of West Bengal and Odisha. This reduces the fertility of the soil and turns it unproductive for a good amount of time.
- **Overflow of Seawater:** There will be an overflow of seawater due to heavy wind and high waves as seawater overflows and submerges the land. The salty water will kill crops and make the farm land infertile. Seawater also kills the fish which are rare in the freshwater ponds.

That is a severe cyclone is detrimental for the agriculture and fisheries sector.

- **Collapse of Trees and Buildings:** Uprooting of trees may cause death and injury to human beings and animals. It blocks roads and disrupts transportation. Falling of trees also snap electric wires which cuts the supply of electricity and communication. All of these are loss of public and private assets. Snapping of electric wires and telephone lines may disrupt many economic activities which has a compounding effect on many sectors.

B. Shift in Monsoonal Trend:

Monsoon accounts for about **75 percent** of India's annual rainfall. It is the lifeblood of its nearly **3 trillion dollar** agriculture-dependent economy. An average monsoon has rainfall between **96%** and **104%** of a **50-year** average of **89cm** over the season. In 2022, India has received 11 percent more than average monsoon rain since the four-month season began on June 1. However, the uneven nature of that year's monsoon has raised concerns about crop yields and output. It is also complicating Government efforts to tame inflation. Plantation, growth and harvesting of certain types of crops depends on the monsoon season. If monsoon is late or early or fluctuates from the predictions, then it affects the harvest of the year. Irregular crop growth can lead to an excess or in worse case shortage of essential food in the market causing inflation. This in turn affects the Indian economy since it is mostly agrarian.

Solutions:

To mitigate the effects of Climate Change World Organizations take some action against the GHG emission and Fossil fuels burning. The Kyoto protocol,

Montreal Protocol are the two operationalized policies governed by the United Nations Framework Convention on Climate Change (UNFCCC). Industrialized countries and economies committed in transition to limit and reduce greenhouse gasses (GHG) emissions in accordance with agreed individual targets.

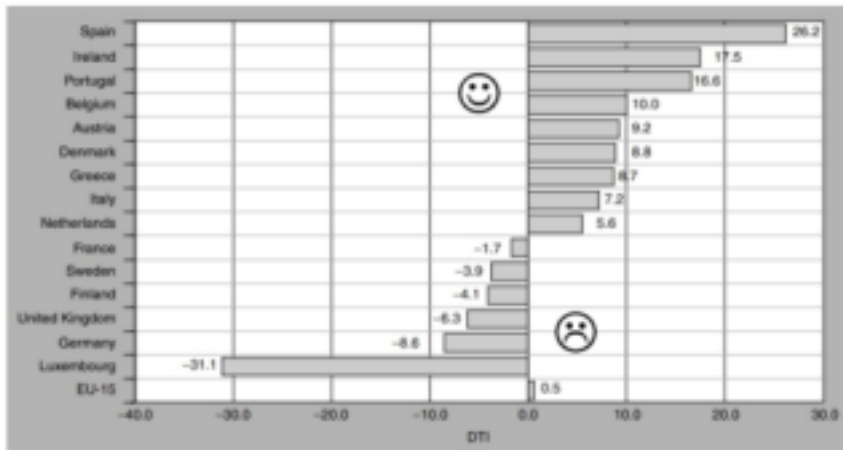


Fig 4: In 2000, total EU greenhouse gas emissions were 3.5% below their 1990 level. The distance-to-target indicator (DTI) 1 is a measure of the deviation of actual greenhouse gas emissions in 2,000 from the linear target path between 1990 and the Kyoto Protocol target for 2008 to 2012, assuming that only domestic measures will be used (From EEA 2002. European Environment Agency. <http://www.eea.eu.int/>).

- **Carbon Politics:** As scientific research progressively confirms the potential serious consequences of human-induced climate change, the debate on climate-change mitigation policies has widened into the political arena. The continuing policy debate has engaged individuals, nongovernmental organizations, national governments, and international organizations. The conservation groups like WWF, Sierra Club, Earth Policy Institute advocate to control the GHG and Carbon emission. But some developed and developing countries didn't agree with the policies and as a result emerged the Carbon Politics.

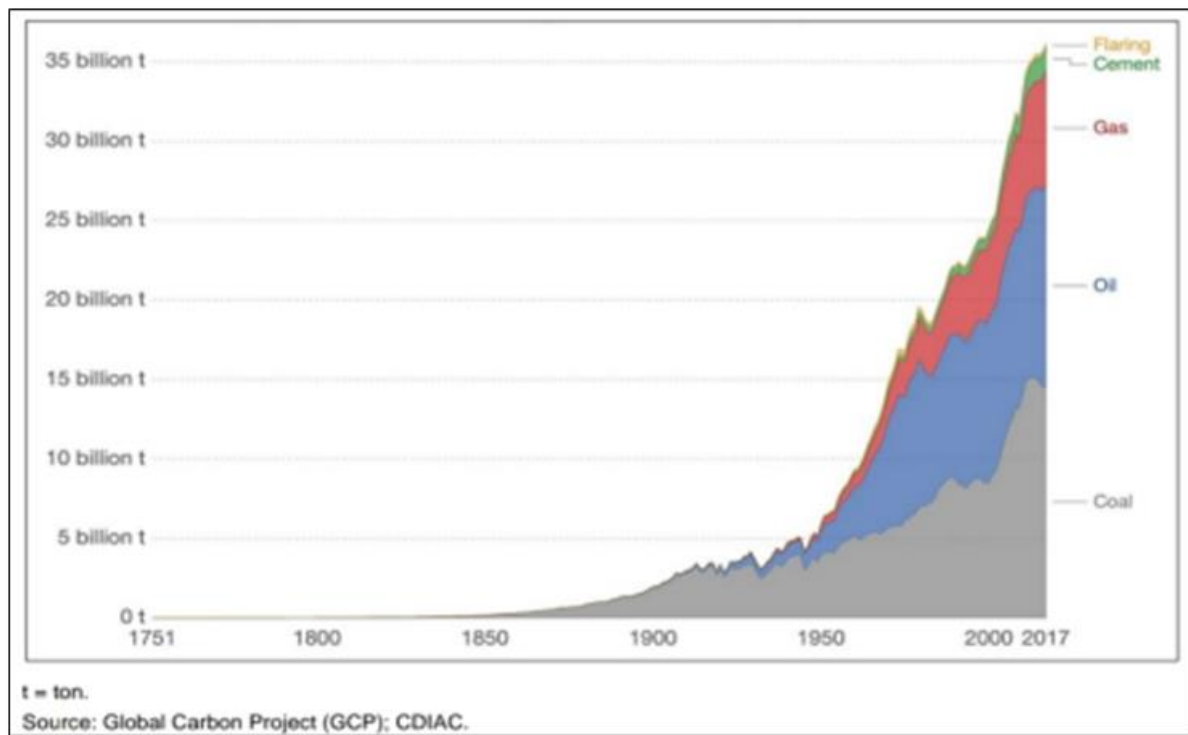


Fig 7: Global Emission of CO₂; Carbon Project

➤ **Failure of the Kyoto Protocol:** The Protocol was in fact doomed from its birth in 1997 because it did not encompass the world's largest and fastest growing economies; it excluded developing countries (including the People's Republic of China) from binding targets, and the USA failed to sign up. But India plays a great role to ratify this protocol and tries to reduce GHG emission for the national and global faith. The main agenda of these protocol is to minimize the use of fossil fuels in the middle-east countries and maximize the economic and environmental wellbeing and make world free to breathe in cool atmosphere.

7. Conclusion

Climate change is the most important problem of World. The consequences created by the climate change destroys economy simultaneously. Heat waves are a reality, World needs to adopt. Globally we don't have to be reactive but become protective. Heat strokes are a serious medical condition. In 2015, **2422** people died due to heat strokes. In 2019, the Indian government formulated a 'India Cooling Action Plan' which has some objectives and its deadline is in **2038**. In Agricultural sector, they needs better technologies and equipments for no to completely depend on climate. The Industrial and Tourism sector also needed the good infrastructure to tackle with this climate Change. The findings of IPCC helps to get rid of this situation. We need to unite globally for make Earth free from these warming of the planet and leave a foot print in our economy. These kind of situation causes the fall in economy. At

the time of Pandemic our world had faced a huge Bio-storm and the climate change along with make economic disaster.

The **Kyoto Protocol** can give us a supreme benefit in the economic sector. For the policy politics dichotomy the Earth suffers with the Climate Change issues creating impediments in the global economy. The benefits of policies to mitigate climate change extend beyond direct effects on climate to what are termed ancillary benefits. If these benefits can be given monetary value, they can then be subtracted from the costs of mitigation. For example, sulphur dioxide (SO₂), a common air pollutant from fossil-fuel combustion, causes acidic rain damage to habitats, and as a lung irritant impacts human health.

Costs for the United States to meet Kyoto targets range from about 0.2 to 4% of GDP per year with typical estimates of about 1 to 2.5% of GDP. IPCC has some certain findings to manage the climatic situation blowing **1.5 degree** Celsius which is known as “**OVERSHOOT SCENARIO**”. Solar energy, wind energy, electrification of urban systems are technically variable cost effective mitigation systems and generally supported by the public. **IPCC** states that there is no heavy amount of global capital investment for reduction of GHG emission. Green technologies, renewable energies are very cost effective affordable financing adopted by the developed countries to mitigate Global Climate Change. Many now consider the Kyoto Protocol only as a first step in what may be a negotiating process lasting decades. Even if the Protocol were fully implemented soon, and industrialized countries held their emissions at the targeted levels for the rest of the twenty-first century, GHG concentrations in the atmosphere will continue to rise and our Earth will again breathe in fresh air with a stable economy.

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NAVIGATING THE ECONOMIC SLOWDOWN: INDIA'S RESPONSE AND COMPETITIVE EDGE IN THE GLOBAL MARKET

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ABSTRACT

The motivation of the present study stems from the implication of a global economic slowdown; global activity clearly indicates that the slowdown is broad-based and sharper-than-expected, with inflation higher than seen in decades. Our interest lies in observing the world economy as a background study and using that perspective, we analyze the Indian economy along with its emerging neighbors. The cost-of-living crisis, tightening financial conditions in most regions, the lingering COVID-19 pandemic and Russia's invasion of Ukraine, all weigh heavily on the outlook. The war in Ukraine has caused significant supply disruptions and higher price volatility across several commodities, including energy, food, and fertilizers. USA being an advanced economy is on the brink of economic recession, which has far reaching implications on the supply chains, trade and commerce and by extension, on the world economy.

We have accessed secondary data from journals, articles, and digital news media and attempted a comparative analysis of India's three neighboring economies, Pakistan, China and Sri Lanka who are inter-connected in terms of trade, environmental effects and growth rate with India. India has posed itself as a leader before its neighboring countries who can emulate the recovery strategies to survive their downturn. Monetary policy should stay on the course to restore price stability, and fiscal policy should aim to alleviate the cost-of-living pressures while maintaining a sufficiently tight stance aligned with monetary policy. Structural reforms can further support the fight against inflation by improving productivity and easing supply constraints, while multilateral cooperation is necessary for fast-tracking the green energy transition and preventing fragmentation.

Keywords: Economic slowdown, Covid-19, supply disruption, brink of recession, India's neighboring economies.

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INTRODUCTION

The three largest economies in the world—the US, China, and the Euro area—have all seen a significant slowdown. Under the circumstances, even a moderate hit to the global economy over the next year could tip it into recession.

The pandemic and vulnerabilities in the real estate market had caused the World Bank to lower its China growth prediction for the year. The World Bank announced that it has reduced its projection from the 4.3% expected in June to 2.7% in an official statement. Additionally, it decreased the prediction for the next year from 8.1% to 4.3%. The global economy is being pounded by rising interest rates intended to combat runaway inflation that has been sparked by Russia's war in Ukraine as well as global supply chain snarls, which coincide with China's downturn. World trade hit a record \$32 trillion in 2022, but growth turned negative in the last half of the year. Environmentally friendly products defied the trend.

The World Bank stated in its study that the worsening of natural disasters continues to shed light on the social and economic effects of climate change. According to the report, the war in Ukraine, high inflation, supply chain disruptions, and the global economic downturn all worked together to drive significant price increases for many agricultural products and inputs, such as fertilizers, in 2022, signaling a marked increase in food insecurity across the globe. The research claims the Covid-19 pandemic to be the cause of the worst setback to the attempts of reducing global poverty in decades, and the recovery has been incredibly disproportionate. 685 million people are living in extreme poverty by the end of 2022, making that year the second-worst year for poverty reduction in the previous 20 years (after 2020). Additionally, it noted that the debt crisis affecting developing nations has worsened over the previous year, with almost 60% of the world's poorest nations either in debt trouble or in danger of it.

There are a lot of questions as 2023 progresses. Will inflation decrease? Which nations will be most affected by the recession? Can supply chains get more efficient? Will the labor market remain tight? What is the forecast for each of the world's major economies?

The slow recovery of the world economy from the pandemic and Russia's invasion of Ukraine is still on schedule. The recently opened Chinese economy is rapidly recovering. While the war's effects on the oil and food markets are waning, supply chain disruptions are also easing. In addition, the widespread and coordinated tightening of monetary policy by most central banks should begin to show results, with inflation returning to target levels.

OBJECTIVES

- * Identifying the root of the economic slowdown: the covid-19 pandemic and the invasion of Ukraine by Russia.
- * Using certain parameters to analyze the effects the slowdown has on trade, commerce and the environment; taking India and its neighboring emerging economies as examples.
- * Summarizing certain strategies and policies to curb the impact of the impending recession.

Plan of the study: We attempt to distinguish between an economic slowdown and an economic recession in terms of the present global scenario. In recognition of the crucial factors that have led the first world countries like USA and the Euro area into a slowdown, we have analyzed the long-term impact it has left on the other major economies; the countries that are dependent on them in terms of trade, foreign investments, alliances and economic growth. We hold our home economy, India, in the limelight to assess its brilliant trajectory towards being the 5th largest economy in the world, leaving behind the likes of UK, France, Russia and Canada. The comparative analysis we have done with India's three major neighboring countries- Pakistan, Sri Lanka, China- has paved the way to recognize India as a leading economy.

LITERATURE REVIEW

I. Anand and **R. Azad** in their research paper titled “**India’s Economic Slowdown**” (2019) have elaborated that investments in industry have slowed down considerably in the recent years, as has agricultural growth. Falling levels of capacity utilization, building up of food stocks and the state of liquidity in the economy sufficiently prove that the problem today is the lack of demand. Rural distress, rising inequality and falling real wages are driving down demand. The government's response to the slowdown has been woefully inadequate. The biggest impediment to policymaking is not the lack of ideas, but the blinkered vision of economics.

Jonathan Eaton, Samuel Kortum, Brent Neiman, and John Romalis explain in their research paper titled “**Trade and the Global Recession**” (2016) they find that a decline in the efficiency of investment in durable manufacturing capital stocks drove the stunning collapse in trade and in manufacturing products that accompanied the global recession. These shocks reduced final spending on tradable sectors. Their model offers a way to analyze jointly the macroeconomic experiences of many countries connected by trade. The framework allows us to identify where shocks originate and how they spread from country to country, providing a richer picture of the common and idiosyncratic characteristics of global fluctuations. It also suggests some promising avenues for future research, both in terms of expanding the scope of this analysis and in terms of furthering the methodology.

Florian Hoffmann, University of British Columbia & **Thomas Lemieux**, University of British Columbia, and the National Bureau of Economic Research have explained in their paper titled “**Unemployment in the Great Recession: A Comparison of Germany, Canada, and the United States**”(2015) where they explore several possible explanations for the weak labour market performance of the United States in the aftermath of the Great Recession by contrasting its experience to those of a large set of OECD countries. They also conduct a detailed micro-level analysis of labour market outcomes in two comparison countries, Canada and Germany, that faced similar declines in output during the recession but that have not experienced as persistent unemployment since then. Adapting this comparative perspective enables us to rule out several previously suggested mechanisms as the main driving forces of Canada's and Germany's relative successes. In particular, they show that the “German labour market miracle” is not a miracle at all, as Germany's labour market performance is in line with its strong GDP growth in the post-recession period. They also argue that wage moderation is not likely to be the main explanation for Germany's low unemployment rates, as real wages remained constant in other countries that

fares much worse, such as the United Kingdom. In contrast, their findings support recent studies that emphasize the role of the construction boom in the United States as the main driving force of its troubled labour markets.

Nima Norouzi in their paper titled “**Post-COVID-19 and globalization of oil and natural gas trade: Challenges, opportunities, lessons, regulations, and strategies**” (2021) explains that the Coronavirus (COVID-19) outbreak hit the global economy like a tsunami. Every aspect of human society, including the energy industry and market, is affected by this pandemic. The pandemic has affected prices, demand, supply, investment, and several other aspects of the energy sector, including the oil and gas industry. This article is aimed to analyze the impacts of COVID-19 on the oil and gas industry and give a perspective of the post-COVID-19 oil and gas market. Results of this article show that COVID-19 impacts the oil and gas industry. The short-term impact is nearly 25% decrease in petroleum consumption, slowly recovering to its former amount and even growing more. The long-term impacts are the 30% to 40% decrease in the CAPEX and R&D investments over the oil and gas market, which is a regional scale in the United States, caused oil exploitation projects to decrease from more than 800 in 2019 to 265 in 2021. Finally, this article discusses acknowledging oil and gas trade as a part of World trade organization (WTO/ECT) regulations. And considering it a general energy commodity. An act that reduces the freedom of action of oil-exporting governments and great oil cartels and protects their interests in a globalizing competitive energy market.

METHODOLOGY

- o A short elaboration on the reasons why the leading economies of the world are heading towards a recession or are “technically” already in one; and reports from several official sources on the incoming downturn.
- o To analyze economic slowdown graphically in terms of some selected parameters: annual GDP growth, GDP per capita growth, inflation and unemployment rate.
- o Comparative analysis of India and its neighboring countries on the extent their economic slowdown.
- o Preventive strategies that could be implemented by government authorities to tackle the downturn. Policies that have been applied in the past with positive results have been briefly discussed because they could be used to some extent in current situations.

ANALYSIS

CHALLENGES FACING THE WORLD ECONOMY

Policymakers face difficult trade-offs in steering their economies through the current crises and supporting an inclusive and sustainable recovery. Macroeconomic policies need to be carefully calibrated to strike a balance between stimulating output and taming inflation, with effective

coordination between monetary and fiscal policies minimizing the risks of a prolonged and severe economic downturn. Risks of policy mistakes are significant, especially since macroeconomic policy responses have limited capacity to address non-economic shocks. Policy missteps could aggravate economic downturns and inflict further socio-economic harm, especially on vulnerable groups. Growth momentum in the United States, the European Union, and other developed nations has slowed, weighing on the rest of the world economy. In the United States, GDP is expected to rise by only 0.4% in 2023, after growing by 1.8% in 2022.

Risk of overtightening monetary policy: Many developed country central banks, including the Federal Reserve and the European Central Bank, were initially reluctant to raise policy rates, perceiving the rising inflation as transitory. Rapid and synchronized monetary tightening by the world's major central banks have pulled too much liquidity out of markets too quickly, generating significant negative spill-over effects on the global economy and weakening the economic prospects of the vulnerable countries. This will require more effective coordination among major central banks, supported with clear policy messages to manage and moderate inflationary expectations.

Fiscal Austerity: Amid an increasingly challenging macroeconomic and financial environment, many developing countries are at risk of entering a vicious cycle of weak investment, slow growth and rising debt-servicing burdens. Any rapid fiscal consolidation, through significant expenditure cuts or tax hikes, would likely push economies into recession or lead to a protracted period of slow growth. This will worsen rather than improve debt sustainability in developing countries. The current challenges demand a transformative SDG stimulus package, recently proposed by UN Secretary-General António Guterres. This would help offset deteriorating financing conditions and allow developing countries to scale up investment in sustainable development. The package addresses both short-term urgencies and long-term sustainable development finance needs, calling for a massive increase in financing for sustainable development, including humanitarian support and climate actions, through concessional and non-concessional funding.

Importance of international cooperation: The pandemic, the global food and energy crisis, climate risks and the looming debt crisis in many developing countries are testing the limits of the existing multilateral frameworks. International cooperation has never been more important than now to face these multiple global crises and bring the world back on track to accelerate progress towards the SDGs. The financing requirements for developing countries to reach the SDGs and address the climate crisis have been estimated by a range of entities to be in the region of a few trillion dollars per year.

Given the already limited fiscal space in developing countries, and growing needs for stimulating recovery and protecting the most vulnerable, these countries face significant challenges in making such investments.

PRE-PANDEMIC & POST-PANDEMIC ANALYSIS OF ADVANCED ECONOMIES:

GDP PER CAPITA GROWTH (ANNUAL %)

GDP PER CAPITA GROWTH (ANNUAL %)							
COUNTRIES	2015	2016	2017	2018	2019	2020	2021
UNITED STATES	2	0.9	1.6	2.4	1.8	-4.3	5.5
UNITED KINGDOM	1.8	1.5	1.4	1	1.1	-9.6	7
JAPAN	1.7	0.8	1.8	0.7	-0.1	-4.2	2.1
GERMANY	0.6	1.4	2.3	0.8	0.8	-4.6	2.9
KOREA REPUBLIC	2.3	2.5	2.9	2.5	1.9	-1	4.2

SOURCE: (Source: World Development Indicators/The World Bank)

GDP GROWTH (ANNUAL %)

GDP GROWTH (ANNUAL %)							
COUNTRIES	2015	2016	2017	2018	2019	2020	2021
UNITED STATES	2.7	1.7	2.3	2.9	2.3	-3.4	5.7
UNITED KINGDOM	2.6	2.3	2.1	1.7	1.7	-9.3	7.4
JAPAN	1.6	0.8	1.7	0.6	-0.2	-4.5	1.6
GERMANY	1.5	2.2	2.7	1.1	1.1	-4.6	2.9
KOREA REPUBLIC	2.8	2.9	3.2	2.9	2.2	-0.9	4

SOURCE: (Source: World Development Indicators/The World Bank)

INFLATION, CONSUMER PRICES (ANNUAL %)

INFLATION, CONSUMER PRICES (ANNUAL %)							
COUNTRIES	2015	2016	2017	2018	2019	2020	2021
UNITED STATES	0.1	1.3	2.1	2.4	1.8	1.2	4.7
UNITED KINGDOM	0.4	1	2.6	2.3	1.7	1	2.5
JAPAN	0.8	-0.1	0.5	1	0.5	0	-0.2
GERMANY	0.5	0.5	1.5	1.7	1.4	0.5	3.1
KOREA REPUBLIC	0.7	1	1.9	1.5	0.4	0.5	2.5

SOURCE: (Source: World Development Indicators/The World Bank)

OIL RENTS (% OF GDP)

	OIL RENTS (% OF GDP)						
COUNTRIES	2015	2016	2017	2018	2019	2020	2021
UNITED STATES	0	0.1	0.2	0.4	0.4	0.2	..
UNITED KINGDOM	0.2	0.2	0.3	0.5	0.5	0.3	..
JAPAN	0	0	0	0	0	0	..
GERMANY	0	0	0	0	0	0	..
KOREA REPUBLIC	0	0	0	0	0	0	..

SOURCE: (Source: World Development Indicators/The World Bank)

UNEMPLOYMENT RATE (%)

	UNEMPLOYMENT RATE (%)						
COUNTRIES	2015	2016	2017	2018	2019	2020	2021
UNITED STATES	5.28	4.87	4.36	3.9	3.67	8.05	5.46
UNITED KINGDOM	5.3	4.81	4.33	4	3.74	4.47	4.53
JAPAN	3.4	3.1	2.8	2.4	2.4	2.8	2.8
GERMANY	4.62	4.12	3.75	3.38	3.14	3.81	3.54
KOREA REPUBLIC	3.55	3.65	3.65	3.82	3.75	3.93	3.53

(Source: macrotrends.net)

INDEX

	PRE-PANDEMIC
	POST-PANDEMIC

In South Asia, the economic outlook has significantly deteriorated due to high food and energy prices, monetary tightening, and fiscal vulnerabilities. Average GDP growth is projected to moderate from 5.6 per cent in 2022 to 4.8 per cent in 2023. The prospects are more challenging for other economies in the region, with Bangladesh, Pakistan and Sri Lanka seeking financial assistance from the IMF in 2022.

INDIA

Given the 50/50 likelihood of a recession in 2023, the picture is rather hazy. By 2023, a recession is predicted due to the mounting uncertainties and unfavorable economic growth in the US, Japan, Europe, and China. According to Mr. Rajiv Kumar, a former vice-president of Niti Ayog, the Indian economy may be badly impacted by the anticipated recession, but we may expand by 6-7% in 2023–2024. The declining value of the Indian rupee would not negatively impact growth during the anticipated recession in India and throughout the world, he continued, as Indians are depending less on imported commodities.

Impact of the 2023 global recession on India

According to the estimate, India's GDP would grow to \$10 trillion by 2035 and take third place in the world by 2032. Being one of the great superpowers, the US, a moderate or worse recession will eventually have an impact on the entire world.

A number of European bank failures, declines in many stock indexes, and huge losses in the value of the Indian market were all signs of the crisis's eventual growth and spread into a worldwide economic shock. Given the huge outsourcing contracts Indian companies had with US clients, a downturn in the US economy was definitely bad news for India. India's exports to the US have increased over time. India, however, was touched and made it through the devastating financial crisis of September 2008.

In 2023–2024, India would have GDP growth of between 6.0 and 6.8 percent, depending on the trajectory of global economic and political developments. Economic Survey 2022-23 estimates that real GDP growth will be 6.5 percent at the baseline level in FY24. The economy is anticipated to grow by 7 percent (in real terms) for the fiscal year ending in March 2023, up from an 8.7 percent growth the year before.

Micro, Small and Medium Enterprises (MSME) sector growth was remarkable high averaging over 30.5% during Jan-Nov 2022. In the current year, the Central Government's capital expenditure (CAPEX), which increased by 63.4% in the first 8 months of FY23, was another growth driver of the Indian economy. The RBI predicts that headline inflation would be 6.8% in FY23, which is over its target rate. A significant decline in inventory overhang to 33 months in Q3 of FY23 from return of 2 months last year was aided by a ranging return of migrant workers to construction activities in the housing market. The first half of FY23 and the surge in export growth caused a shift in the production processes' gears from mild acceleration to cruise mode. The highest second quarter of any year since 2013–14 saw private consumption as a percentage of GDP stand at 58.4 percent in Q2 of FY23, aided by a rebound in contact-intensive services like trade, lodging, and transportation. Survey results point to a lower World Trade Organization forecast for global trade growth, from 3.5 percent in 2022 to 1.0 percent in 2023.

Developing countries like India and their neighbouring countries have survived the impacts of the recession and have shown growth in their GDP. The Indian government has implemented certain policies to revive the economy. A major boost to the Indian economy during 2020 was the introduction of the Atmanirbhar Bharat Campaign by Prime Minister Narendra Modi.

The Production-Linked Incentive (PLI) scheme will also pave way for a speedy recovery of the economy.

India's policy implementation leading to a speedy recovery post-Covid:

According to the Bloomberg survey, India is least probable to slip into recession in the near future, rather the country is presently in a recovery stage from the post-pandemic economic slowdown. Fiscal policy measures announced by the Indian Centre after the lockdown was imposed:

ATMANIRBHAR BHARAT PACKAGE 1.0

- * Rs 3 lakh crore collateral-free automatic loans for businesses, including MSMEs
- * Rs 20,000 crore subordinate debt for stressed MSMEs
- * Rs 50,000 crore equity infusion through MSME fund of funds

ATMANIRBHAR BHARAT PACKAGE 2.0

- * Rs 25,000 crore as additional capital expenditure to the Ministry of road transport and Ministry of Defence
- * Boost capital expenditure
- * LTC voucher scheme

ATMANIRBHAR BHARAT PACKAGE 3.0

- * Rs 18,000 crore additional outlay for PM Awaas Yojana (PMAY) – Urban
- * Boost for Rural Employment
- * Atmanirbhar Bharat Rozgar Yojana

MONETARY MEASURES ADOPTED BY RBI

- * Lowered repo and reverse repo rates by 115 and 155 bps, respectively
- * Injection of durable liquidity through open market operation (OMO)
- * Targeted long-term repo operations (TLTROs) of up to 3 years
- * Reduction in CRR requirement of banks

SOURCE: https://m.timesofindia.com/business/india-business/one-year-of-covid-lockdown-how-indian-economy-dealt-with-the-virus/amp_articleshow/81666829

PAKISTAN

Pakistan is currently dealing with a potent mix of political and economic difficulties. However, this is hardly a scenario that has arisen overnight. All of this is a result of years of poor political and economic management by several Pakistani regimes. The present crisis is largely viewed as a self-inflicted wound by the Pakistani elite themselves. This has been further accompanied by the Pakistan economy's intrinsic structural vulnerabilities. There are several factors that have contributed to the perilous state of the country's economy. These comprise:

Pakistan's economy's structural weaknesses

Reliance on textile industry and a few agricultural crops: The textile industry and specific agricultural crops like rice, sugarcane, and cotton are the main drivers of Pakistan's economy. **Dependence on remittances and military spending:** Pakistan is heavily reliant on remittances from Pakistani expatriates working in Gulf Arab countries. Additionally, a significant portion of Pakistan's GDP is consumed by military spending, which has increased over the years.

Lack of diversification and fiscal challenges: Pakistan has struggled to diversify its economy and adapt to changing circumstances. Vested interests, cronyism, corruption, and a political economy dependent on grants and aid have hindered the country's fiscal health. Limited efforts have been made to expand the tax base and diversify revenue streams.

Economic challenges and external factors: Pakistan's economy has been impacted by high inflation, critically low foreign exchange reserves, and the failure of international lenders like the IMF to provide additional loans. The postponement of an IMF bailout package in 2020 and the global pressure on food and energy prices due to the Russia-Ukraine conflict have further strained Pakistan's economy.

Devastating Flood of 2022

The floods in 2022 had a severe impact on Pakistan, causing extensive damage to infrastructure and displacing millions of people. The nation was left in terrible shape as a result. **Death toll and infrastructural damage:** According to a World Bank assessment, the floods resulted in 1,739 deaths and approximately \$40 billion worth of infrastructural damage.

Destruction of agricultural crops: The floods, particularly in the Sindh province, destroyed crops such as wheat, dates, bananas, and onions, which are staple foods in Pakistan. This led to the need for importing food commodities that would not have been necessary otherwise.

Impact of Covid-19 outbreak and lockdowns: Pakistan was severely affected by the Covid-19 outbreak and subsequent lockdowns. The relief initiatives undertaken by the government to combat the pandemic strained the national budget, indicating financial challenges.

Imran Khan's disastrous populism

Imran Khan's administration and increased costs of essential goods: Imran Khan's previous administration increased the costs of essential goods to generate additional funds to pay off Chinese debts, which is argued to have triggered the crisis.

Bilateral debt and indebtedness to China: Pakistan's total bilateral debt due in 2023 is close to \$7 billion, comprising over 2 percent of the country's GDP. Additionally, Pakistan owes China, a key ally, close to \$30 billion, which is almost 30% of Pakistan's GDP.

Delay in seeking IMF bailout package: Imran Khan's decision to delay contacting the IMF for a bailout package in 2018, despite economists' advice, was heavily criticized.

Criticism of welfare programs and refusal to hike fuel costs: Khan's implementation of welfare programs drew criticism due to concerns over the state's financial capacity to support them. The government also faced criticism for refusing to increase fuel costs, even when the price of petroleum crossed \$100 due to the conflict in Russia and Ukraine in early 2022.

Lack of Fiscal Prudence

Subsidies and low retail rates: Pakistan heavily subsidized power bills and had retail rates for petrol and diesel that were among the lowest in South Asia, potentially impacting the country's economy.

Low tax to GDP ratio: Pakistan has a significantly low tax to GDP ratio, indicating a lack of sufficient tax revenue generation.

Dependence on loans from China and Gulf countries: Due to the expanding fiscal imbalance, Pakistan became increasingly reliant on loans from China and friendly Gulf countries like Saudi Arabia and the United Arab Emirates to sustain its economy.

Rise in external debt: Pakistan's total external debt stocks increased from \$115.695 billion at the end of 2020 to \$130.433 billion by the end of 2021. According to CEIC figures, the nation's foreign debt rose to \$126.9 billion in September 2022. The rising external debt adds to the fiscal challenges faced by Pakistan.

Fall of the Pakistani rupee

Depreciation of Pakistani Rupee: The ongoing depreciation of the Pakistani Rupee against the US Dollar has contributed to the country's increasing external debt.

Declining confidence and low rankings: Foreign investors have stayed away from Pakistan due to declining confidence, low rankings by international rating agencies, and Pakistan's inclusion on the Financial Action Task Force (FATF) grey list, which affects the country's attractiveness for investment.

Low Foreign Direct Investment (FDI) inflows: Over the past 10 years, Pakistan has struggled to attract significant Foreign Direct Investment (FDI), with FDI inflows never exceeding 1% of GDP, according to State Bank of Pakistan data.

Debt trap: Pakistan has fallen into a "debt trap" characterized by the cycle of applying for new loans to repay existing ones. This indicates a pattern of increasing reliance on borrowing to meet financial obligations.

Mounting trade deficit

Growing trade deficit: Pakistan has been facing a mounting trade deficit due to increasing import costs and declining exports.

Record-high trade imbalance: In the current fiscal year, Pakistan's trade imbalance reached an all-time high of USD 48.66 billion, compared to USD 30.96 billion in the previous fiscal year.

Low trade-to-GDP ratio: According to an Asian Development Bank (ADB) assessment in February 2022, Pakistan has one of the lowest trade-to-GDP ratios in the world. This indicates that the country's trade volume is relatively small compared to its overall economic output.

Impact of the Covid-19 pandemic: The situation regarding the trade deficit worsened following the outbreak of the Covid-19 pandemic, suggesting that the pandemic had a negative effect on Pakistan's trade performance.

CHINA

With the exception of the Covid-hit 2020-year, China's GDP grew at its weakest rate since the middle of the 1970s as the second-largest economy in the world suffered under draconian pandemic controls that were unexpectedly lifted late in 2022.

The economy expanded by just 3% last year, considerably behind the government's initial growth targets of 5.5% and 8.1% for 2021. However, the real rate was higher than the 2.7% forecast made earlier this month by the World Bank. Analysts will pay close attention to the 2.9% growth rate for the December quarter, which above market expectations of 1.8%, according to Reuters. The economy remained essentially unchanged when compared to the previous three months, avoiding the 0.8% decline that analysts had predicted.

According to the data, if the 2.2% growth in the first Covid year of 2020 is taken away, China's GDP increased at the weakest rate in around half a century. The Chinese government has continued its Zero-Covid strategy of rolling lockdowns and mass testing to halt the spread of the virus for the majority of the previous three years. Early last month, with little notice and without planning for vaccination drives or other medical measures, it abandoned the program.

However, it has been widely assumed that the policy change will likely contribute to China's economic development in 2023 and beyond. The World Bank predicts that GDP growth will accelerate to 4.3% this year and 5% the next year, but many private economists are currently outpacing these predictions.

While we expect China's long-term growth to continue outpacing growth in advanced economies, risks are tilted to the downside. Domestically, the country's property downturn will not only affect industrial activity, but also erode households' wealth levels and, therefore, exacerbate downward pressures on domestic demand. Externally, the rising tensions between Western nations and China could severely damage the growth outlook for China's high-tech sectors. These factors will weigh on China's already falling aggregate rate of return on capital.

Insights for what's Ahead

China's GDP is forecast to rebound to above 5 percent in 2023, assuming the government relaxes its "dynamic zero-COVID" strategy next year. Industrial production growth will slow down in 2023 as external demand moderates. China's aging population and the slowdown in capital accumulation will lead to further growth deceleration in the coming decade. The downturn of the housing sector will likely last for years, affecting China's medium- to long-term growth through several fundamental channels. Investment growth in manufacturing will rally in industries where businesses consolidate as well as those with strong state support. While the energy crunch in the past two years has resulted in increasing reliance on coal, the government is not retracting its long-term decarbonization plans. After three years of stringent economic restrictions expired, people embarked on a spending binge, which helped China's economy get started to a strong start in 2023. The National Bureau of Statistics said on Tuesday that the first quarter's gross domestic product increased by 4.5% compared to the same period last year. That exceeded the 4% growth prediction made by analysts surveyed by Reuters. However, private sector employers in the nation are still pessimistic about longer-term prospects as evidenced by the fact that private investment remained remarkably flat and young unemployment shot up to the second highest level ever. Consumption had the greatest recovery. The fastest rate of growth since June 2021 was seen in retail sales, which increased 10.6% in March from a year earlier.

SRI LANKA

Since the country's economic crisis peaked in the middle of 2022, Sri Lanka's economy has steadied. In March 2023, Sri Lanka successfully secured a US\$3 billion loan from the International Monetary Fund (IMF) after enduring a year of economic hardship and challenging talks with creditors.

The IMF program's approval marks a significant turning point in Sri Lanka's recovery. Increased investor confidence, the release of several billion more dollars in finance from international development banks, and the easing of foreign exchange restrictions on necessary imports are all benefits of this. Civil unrest has considerably decreased as shortages have been eliminated. The implementation of several economic reforms, the continuation of debt restructuring discussions, and maintaining fiscal consolidation are all part of the upcoming phase of Sri Lanka's economic recovery. High inflation, high interest costs, declining tourist numbers, meagre foreign exchange reserves, and food shortages continue to be constraints on Sri Lanka's economy.

Key industries including tourism, IT and shared services, maritime services, and agri-tech promise future market prospects as Sri Lanka sets out on a road of reform, recovery, and prosperity.

Securing IMF Loan and Unlocking Financial Support

Sri Lanka had its biggest economic crisis in 75 years of independence in May 2022, leading to the nation's first-ever default on its international debt commitments. The GDP of Sri Lanka contracted by 7.8% last year, and it is anticipated to contract by a further 3% in 2023.

Overall, Sri Lanka's economy has recovered from its worst point. Sri Lanka has obtained a US\$3 billion IMF loan under its Extended Fund Facility (EFF) one year after the crisis. The loan, which unlocks further funding from the World Bank and the Asian Development Bank totaling up to \$7 billion, is crucial for the nation's economic recovery.

The IMF EFF programme aims to protect vulnerable populations and defend Sri Lanka's financial system while working to restore macroeconomic stability and debt sustainability. Analysts anticipate that in 2024 economic growth will pick up.

Double deficit: The fiscal deficit in Sri Lanka has been a pressing concern, as the government's expenditure has surpassed its revenue, leading to increased borrowing and accumulating public debt. This has been fueled by factors such as high public spending, inadequate tax collection, and subsidies on essential commodities.

Simultaneously, Sri Lanka has been struggling with a significant current account deficit, indicating that the country's imports exceed its exports. This imbalance can lead to a depletion of foreign exchange reserves, affecting the stability of the currency and overall economic health. The current account deficit has been influenced by factors such as high import dependency, trade imbalances, and limited diversification of exports. To tackle this issue, Sri Lanka needs to focus on boosting export industries, promoting foreign direct investment, and exploring opportunities for economic diversification.

Addressing both the fiscal and current account deficits requires a comprehensive approach, encompassing structural reforms, prudent fiscal management, and initiatives to enhance export competitiveness. By implementing effective strategies to reduce the fiscal deficit and foster a favorable trade balance, Sri Lanka can work towards achieving sustainable economic growth and stability.

Debt to GDP ratio: The debt-to-GDP ratio of Sri Lanka has been a matter of concern, indicating the country's level of debt compared to its economic output. A high debt-to-GDP ratio implies a higher burden of debt on the economy, potentially affecting its long-term sustainability and economic stability. Sri Lanka's debt-to-GDP ratio has been on an upward trajectory in recent years. The country's heavy borrowing to fund infrastructure projects, meet fiscal deficits, and cover current account imbalances has contributed to this increase. Insufficient revenue generation and challenges in controlling government expenditure have also added to the growing debt burden. A high debt-to-GDP ratio poses several risks for Sri Lanka. It can limit the government's fiscal flexibility, leading to difficulties in servicing debt obligations and potentially crowding out investments in other sectors. It can also result in higher interest payments, diverting resources away from critical development priorities such as healthcare, education, and infrastructure.

Damage to tourist sector: The tourist sector in Sri Lanka has experienced significant damage due to various factors, resulting in significant challenges for the industry. One of the most significant blows was the Easter Sunday bombings in April 2019, which targeted several hotels and churches, leading to a sharp decline in tourist arrivals and a negative impact on the country's reputation as a safe travel destination. Following the bombings, international travel advisories were issued,

discouraging tourists from visiting Sri Lanka. This led to a substantial decrease in tourist arrivals, causing severe economic repercussions for the tourism sector.

The COVID-19 pandemic further exacerbated the challenges faced by the tourism sector. Travel restrictions, lockdowns, and border closures implemented to contain the spread of the virus resulted in a virtual halt in international travel. Sri Lanka's tourist arrivals plummeted, and the sector experienced a prolonged period of dormancy, leading to immense financial strain. Employment opportunities in the tourism sector have diminished, affecting the livelihoods of many individuals and communities reliant on it.

Political turmoil: Sri Lanka has experienced political turmoil in recent years, characterized by power struggles, constitutional crises, and instability within its political landscape. These issues have had significant implications for governance, public trust, and the overall socio-political environment in the country. Corruption and allegations of mismanagement have also been significant contributors to political turmoil in Sri Lanka. Instances of corruption scandals involving high-ranking officials have undermined public trust and confidence in the government.

These issues have hindered effective governance, eroded institutional credibility, and created a climate of political instability. Political turmoil has repercussions for the country's development and international relations. It can deter foreign investment, hamper economic growth, and impede policy implementation. It also poses challenges in addressing pressing issues such as social inequality, ethnic reconciliation, and human rights. Another factor contributing to political turmoil in Sri Lanka has been the polarization and fragmentation of political parties. The country's political landscape is characterized by multiple parties representing different ethnic and regional interests, often leading to fragile coalitions and difficulties in forming stable governments. This has resulted in frequent changes in leadership, party defections, and challenges in implementing long-term policy agendas.

RESULTS

INDIA'S POTENTIAL SOVERIGNTY AMONG SAARC COUNTRIES

Since our economy is robust enough to sustain steady growth momentum, the majority of economic stalwarts feel that the global recession won't have a significant impact on it. During economic downturns, not all firms and industries experience the same hardship. Despite the fact that some firms profit from the recession, there are few bright spots. The customers' reduced use of alternatives is the cause of this. Strong companies may use this chance to prosper as labor and capital become more affordable.

Two observations are worth noting: Despite the global slowdown, exports performed well, probably because of the depreciated currency against the dollar. While goods exports remained modest, India's services exports skyrocketed by 30% between April and February. Interestingly, the share of business and professional services in total services exports also increased as

companies globally now prefer outsourcing a wide range of professions, such as accounting, audit, R&D, quality assurance, and after-sales service.

Second, the past few quarters' data point to fiscal prudence and discipline as government spending contracted for the second consecutive quarter. GVA growth in public administration services also fell. In the first 10 months, the fiscal deficit accounted for 67.8% of the target deficit of this fiscal year. The government's effort to consolidate its expense instils confidence that it may reduce the fiscal deficit to below 4.5% by 2025–26, with a fairly steady decline over the period as charted in the budget this year.

INDIA GDP GROWTH projections in % for 2023

IMF	8.2*
WORLD BANK	7.5
MPC	7.2

*IMF is in the process of revising this forecast; (source: respective institution)

Economy	Latest projection	Departure from earlier projections
US	2.5	-1.2
Euro Area	2.5	-1.7
Japan	1.7	-1.2
China	4.3	-0.8
India*	7.5	-1.2
World	2.9	-1.2

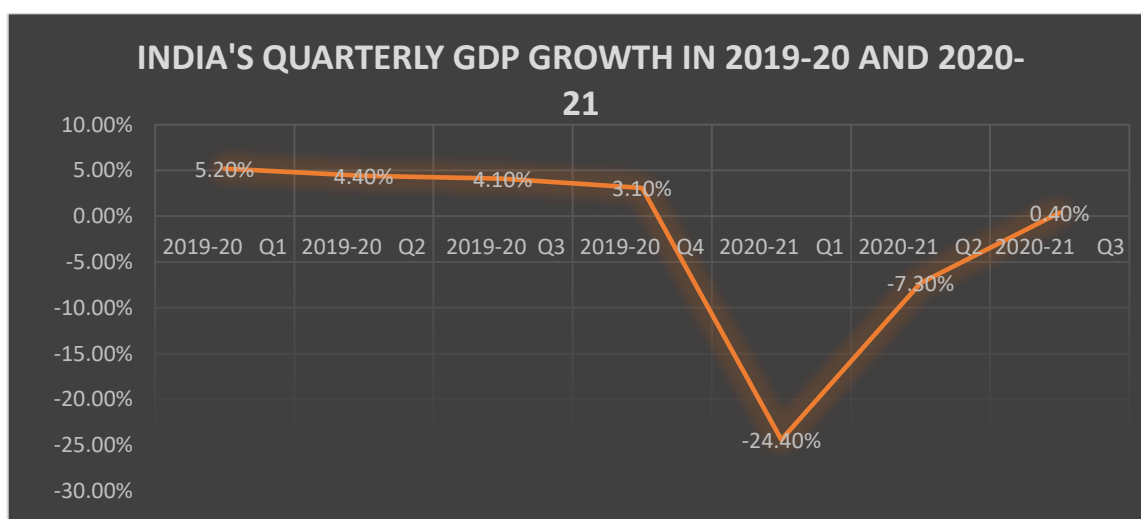
*2022-23; (source: World Bank's latest global economic prospects)

INDIAN ECONOMY WITNESSING V-SHAPED RECOVERY

Nothing that the disturbances and uncertainties caused due to COVID-19 reduced private consumption expenditures, Defense Minister Rajnath Singh said the central government has initiated several steps to deal with these challenges, adding that the results are visible. According to the surveys of many agencies, India continues to grow as one of the fastest-growing major economies in the world. Our exports continue to set new records and are likely to increase further. A major free trade agreement has been signed with Australia and similar agreements with other partner countries as well. India is witnessing a V-shaped recovery after the pandemic. India's focus on logistics has started to remove bottlenecks on the supply side. Contact-based services are also gaining momentum due to the success of our COVID-19 vaccination drive. The gross GST revenue collection which was the highest ever Rs.1.68 lakh crore for April 2022.

Rajnath Singh defined tax collection as a means of completing works of public interest and said the same revenue is reaching more than 80 crore people in the form of free food grains through

‘Pradhan Mantri Garib Kalyan Anna Yojna’ during the COVID-19 situation. He stated that the new investments are being made at the global level which is expected to ease the pressure on the supply chain. He was of the view that the world economy is going through a very difficult phase due to supply chain disruptions and logistic bottlenecks caused by the COVID-19 pandemic and now the Russia- Ukraine conflict. Russia and Ukraine are important commodity producers. Russia is a major producer of food grains and hydro-carbons, while Ukraine is an important producer of wheat, etc. Therefore, the ongoing conflict has impacted the whole world. Since we import hydro-carbon and oilseeds in large quantities, their prices have affected India too. Food and fuel prices have gone up. Core inflation has increased due to the global supply chain and other logistical bottlenecks.



SOURCE: www.business-standard.com SOURCE: TIMES OF INDIA

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Spillover Effects of Pandemic - Comparative Study of India and China at a Glance

Ananya Chatterjee*, Bhaswati Pal*, Sneha Ari*

I. INTRODUCTION

Today the whole world is going through an economic slowdown due the pandemic Covid-19, India and China, the two emerging economies of the world, are no exception. The first case of Covid-19 was recorded in China itself toward the end of 2019 and no longer after this case this deadly disease spread throughout the entire world. India got its first Covid-19 case in March 2020 in the state of Maharashtra. Although the Indian government took necessary steps within the right time to stop its spread. During the period of Covid-19 India recorded 1000 deaths per day on an average. This pandemic struck the whole country with devastating effects. Pandemic, Covid-19 has not only given a massive blow to the health sector of India and China, but it has also hit the economic pillars of both nations. Some important macroeconomic indicators help us to understand the impact during the pandemic?

Table 1: Some important macroeconomic indicators of India and China

Macroeconomic indicators	India	China
GDP at constant prices (2019)	4.0%	5.95%
GDP at constant prices (2020)	-7.3%	2.2%
Unemployment rate (2019)	5.3%	4.5%
unemployment rate (2020)	7.1%	5.0%
Inflation rate (2019)	4.76%	2.90%
Inflation rate (2020)	6.18%	2.42%

In Table 1 we have seen the economic situation of India and China during Covid. We can conclude that there is a temporary slowdown in the economy because of the widespread of Covid-19 across these countries. This slowdown has been not only witnessed in India and China but also many developed countries.

II. OBJECTIVE:

Our main objective is to analyze what are the factors responsible for the economic slowdown in India and China during COVID-19 pandemic. Unfortunately, the COVID-19 pandemic has adversely impacted the economies of both the countries.

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III. METHODOLOGY:

The paper is empirical in nature. Here we used quantitative methodology to illustrate data analysis. The data is secondary data because these data has previously been gathered and we collect the data from different Government publications, websites and journal articles. Here we mainly compare the economic slowdown between India and the second largest economy in the world China in the pre-COVID and post-COVID situation. By using different numerical values and graph we elaborate our analysis. In this paper we show the challenges and difficulties before India and also the way out.

IV. ANALYSIS: INDIA and CHINA

At first, we discuss some major factors responsible for the economic slowdown in India and China. This will be followed by a comparative study of the two economies.

1. INDIA

Declining growth and increased joblessness:-

During the first 21 days of complete lockdown the Indian Economy was expected to lose over 32,000 crore every day. The largest GDP contraction ever happen in Q2 (April-June) FY2020-2021 at -24%. One of the major reasons of this declining growth is rise in Unemployment rates. An estimated 140 million people lost employment while salaries were cut for many others. In April of 2020 the unemployment rate reaching an all-time high of 14.70% and individual income dropped be approximately 40%.

Inflation: -

India works on an inflation targeting mechanism. In India the RBI is targeting the inflation to be 4+-2 percent. For the past five years, India's average rate of inflation has been slightly above 4 percent but during pandemic there has been drastic rise in inflation of the country. Inflation levels had risen to above 8 percent.

Decrease in Government Income: -

During the pandemic all economic activities which require persons to travel or work outside home, such as manufacturing of non-essential goods and construction, have stopped. This has resulted in a loss of income for many individuals and businesses, severely impact the revenue of the Central and State Govt., primarily the tax revenue that would have generated from all such economic activities.

Stress on Supply Chains: -

The year 2020 has been challenging for industries, as the COVID pandemic has caused disruptive risks to the global supply chain. India imports 85% pharmaceuticals ingredients, 55% of electronics and 27% of automotive parts from China. The SCs would be affected severely and a shift in imports would lead to hike in the prices of final goods. India's imports were shrunken by 26% and exports by 45% for April to June quarter of 2020. It shows an affected global supply chain.

Collapse of some major industries: -

At the outbreak of COVID-19 many states have imposed localized lockdowns. For that some industries have to face massive struggle during that period.

- The Hospitality sector (businesses like restaurants, beds and breakfast, nightclubs, pub & more) has contributed as large portion of India's annual GDP has been hit hard by restrictions.
- The Tourism sector contributes nearly 7% to India's annual GDP. The restrictions due to second wave have crippled the tourism sector.
- The real estate and construction activities have started facing a disruption as a large number of migrant workers have left the urban areas.

Now we discuss some major factors responsible for economic slowdown in World's second largest economic country China.

2. CHINA

Zero COVID is wreaking havoc:

The policy involves drastic restrictions on mobility including total closures that have been imposed in several cities. Half of China's highways cannot be used, and ports operate inefficiently.

Crisis in China's property market: -

Weak real estate activity and negative sentiment in housing sector has undoubtedly slowed growth. Demand is down for new homes and that has reduced the need for imports of commodities used in construction. Home prices in dozens of cities have declined by more than 20% during pandemic.

International Transportation problem: -

A prolonged disruption of China's manufacturing industry would be a major shock to the global economy, as China exports up to one third of the world's intermediate goods. Chinese borders have been closed since the start of the pandemic in January 2020. This has caused a dramatic reduction on physical exchanges between China and the rest of the world.

Increasing Unemployment rate: -

High youth unemployment has been a dark stain on China's economy for several years. Unemployment rate in China reaching an all-time high of 6.20 percent in February of 2020.

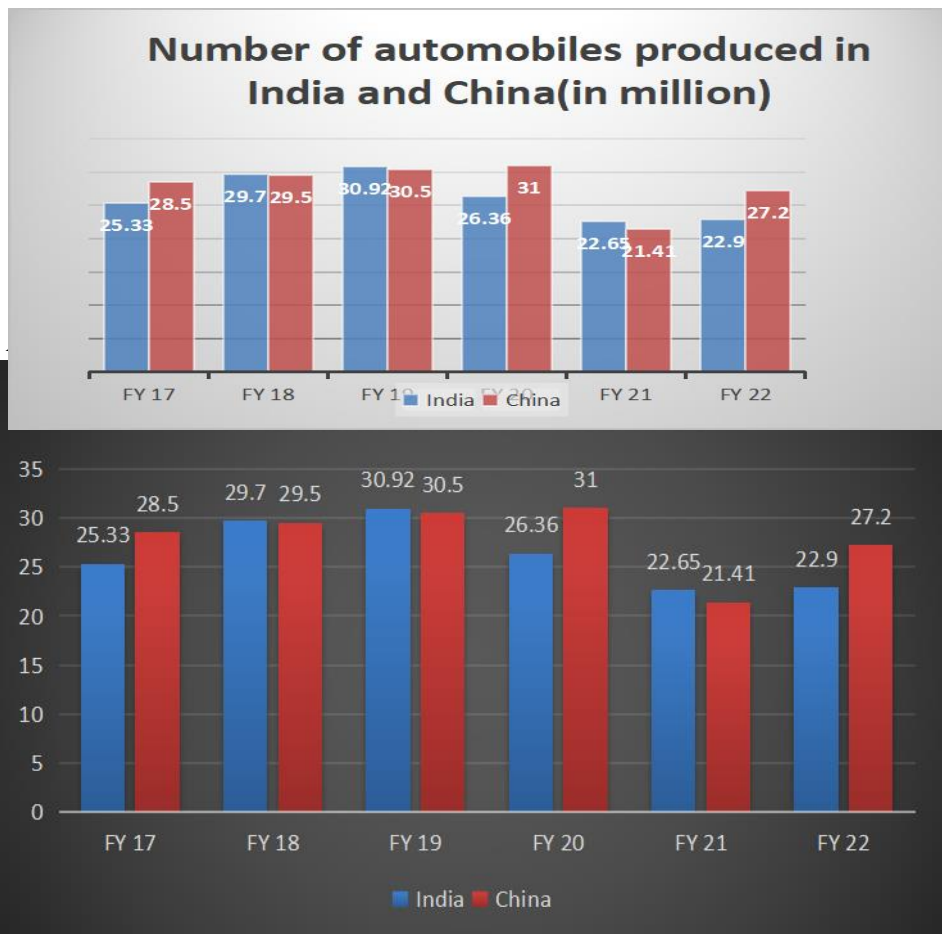
3. INDIA AND CHINA

India and China are two emerging economies of the world. As of 2019, China and India are the second and fifth largest economy of the world respectively, in nominal basis. On PPP basis China is at first and India is at third place. Both countries together share 19.46% and 27.18% of total global wealth in nominal and PPP terms respectively. In 1987, GDP (nominal) of both countries were almost equal. But, in 2019 China's GDP was 4.78 times greater than India.

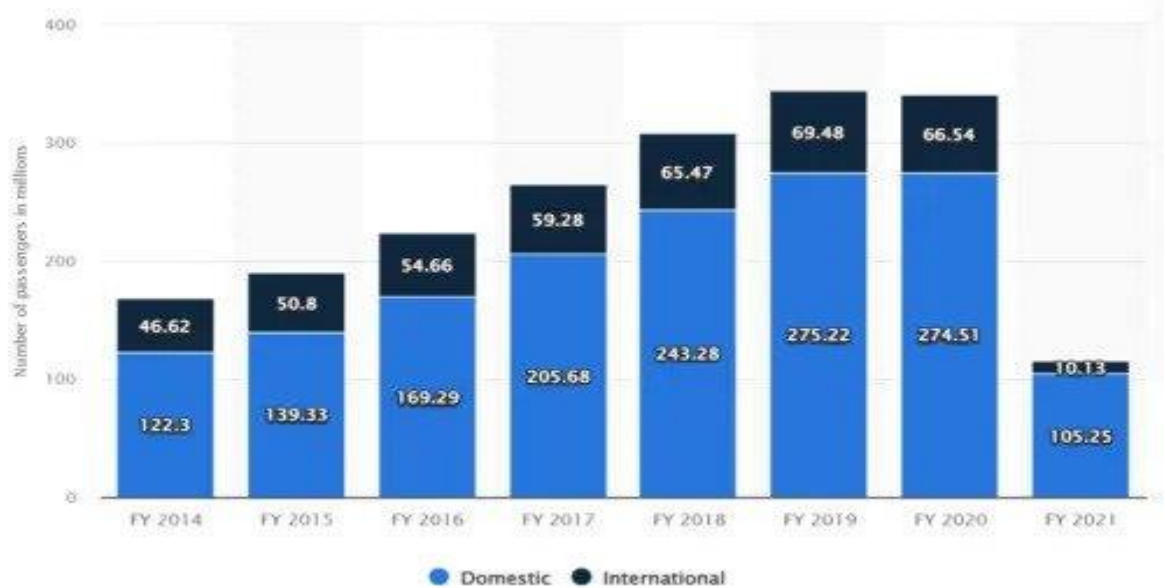
- In 2016 before COVID-19 pandemic India's growth rate was 8.2% and at that time China's growth rate was 6.8%.
- During the pandemic India's growth rate was decreased by 7.9% and China's growth rate was decreased by 2.2%.
- In 2021 India's growth rate raised by 12.5% and after then it was raised by 5.5%.

3.i Performance of different economic sectors:

Automobile Industry:



Aviation Industry



3.ii Performance of different economic sectors in China

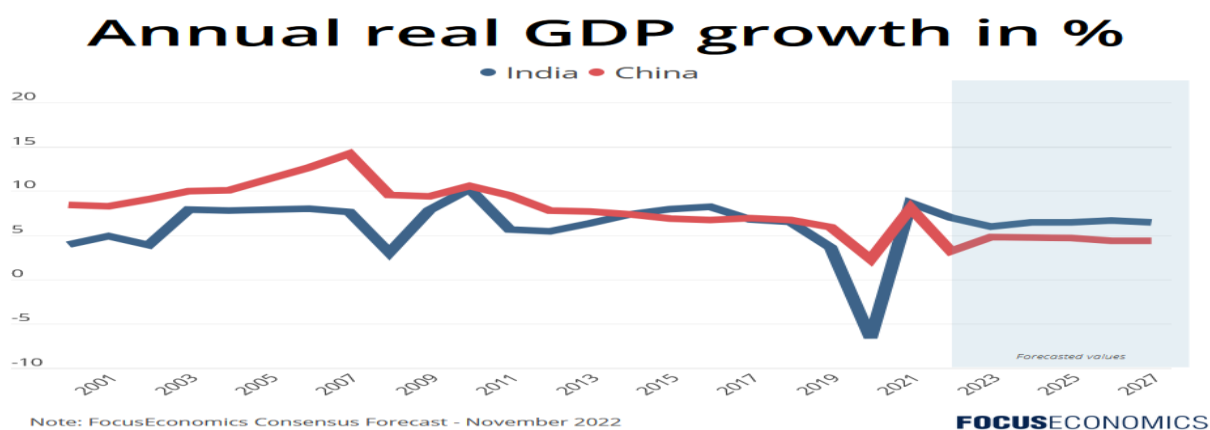


Table Growth Rate (%) in India and China

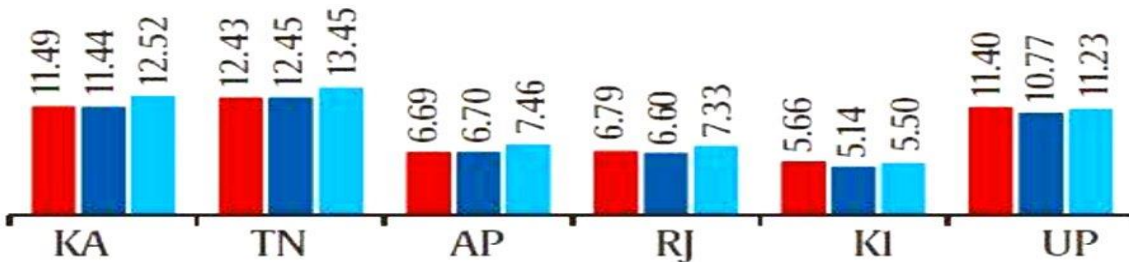
Year	India	China
2016	8.2	6.8
2017	6.7	6.9
2018	6.5	6.7
2019	4.0	5.9
2020	-7.9	2.2
2021	12.5	8.4
2022	6.9	5.5
2023	6.8	5.4

From this above data, we can see that India's economy was worsening in the year before COVID-19. But in case of growth, the Indian economy has grown faster than China.

HOW STATES FARED AFTER COVID

Gross State Domestic Product at constant (2011-12) prices

■ 2019-20 ■ 2020-21 ■ 2021-22 *Figures in Rs '000 cr*



States like-Karnataka, Telangana, Andhra Pradesh, Rajasthan, Kerala, Uttar Pradesh, Maharashtra contribute most of the India's GDP. From the above diagram we can say that in the post COVID situation the GSDP levels of different states increases with compared to pre-COVID situation.

Findings:

- From the diagram of annual real GDP growth, we see that due to the slowdown in 2020 for the pandemic India's growth rate changed by -7.9%.
- And we also see that the Indian economy was already worsening in the year before COVID-19. So, we can't say that COVID-19 one of the biggest reasons of economic slowdown. It triggered the slowdown in 2020.
- But, in spite of these slowdown India's GDP growth rate is rising like a shining star.
- Although, in the post pandemic situation India's GDP growth rate was increased by 12.5% but is not sufficient because, India could add only 350 billion dollars to its economy whereas China added 1,274 billion dollar growing at 7%.
- If India wants to catch China's economy, then India would need to grow at 37.6% to increase its GDP by that much in a year.

V. CONCLUSION:

During times of recession and economic slowdown unemployment increases, inflation rises, income falls, economic infrastructures are collapsed and from the analysis we also know that Indian economy was already worsening in the year before Covid-19 but Covid-19 triggered the slowdown in 2020 that why India's economic growth rate was decreased by 7.9%. For the solution of this problem the leading economists and market researchers support the following remedies to bring the Indian economy on a high growth track.

- **Reduce tax rate and tax rebates:-** If the government cuts the tax rate then the disposable income increases, they invest the money in many types of business which decrease the unemployment rate and increase the business revenue ,cash flows and profits. All of these increase productivity which helps to grow the economy.

- **More government expenditure:-** Government needs to spend more to overcome this situation. It needs to spend more to spur investment and demand in the economy. In this way the government can grow India's GDP rate.
- **Expansionary fiscal policy:-** Expansionary fiscal policy increases the level of aggregate demand either through increases in government spending or through reductions in taxes. Expansionary fiscal policy is most appropriate when an economy is in recession and producing below its potential GDP.
- **Capital inflow:-** When the capital account is liberalized, the interest rate falls. Significant international capital inflows into the country lead the domestic interest rate to move toward world interest rates and therefore enhance economic growth.

It is evident that, though there is a temporary setback on the economy as a result of the widespread of the Covid-19 virus across the country, there are many positives emanating out of the disaster. First and foremost there is a possibility that India may slowly replace China as the world's most favoured investment destination. GDP growth rate will turn positive in the next two quarters and will be back on track in the next financial year.

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Activity Report

Activity Report of One day National Seminar on “75th Year of Independence: The Challenges and Opportunities before India in Contemporary Global Trade Scenario” Organised by Department of Economics, Vidyasagar Metropolitan College in collaboration with Department of Department of Economics, Netaji Nagar College for Women

1. The Seminar began with the introductory speech on the theme of the seminar by Dr. Suparna Nandy Pal, *Convener of the Seminar and Head of the Department of Economics, Vidyasagar Metropolitan College*. In the inaugural session felicitation of the dignitaries who had graced the occasion was conducted by Dr, Bipul De, *Convener and Head of the Department of Economics, Netaji Nagar College for Women*. *The Honourable dignitaries present were:*

- Prof. Rajat Acharyaa, Department of Economics, Jadavpur University
- Prof. Ranajay Bhattacharya. Head of the Economic Division, Indian Institute of Foreign Trade, Kolkata
- Prof. Debashis Majumdar, Department of Economics, The Heritage College, Kolkata
- Dr. Arghya Sarkar, Principal, Vidyasagar Metropolitan College
- Dr. Anindita Majumdar, Convener, Academic Sub-committee, Netaji Nagar College for Women

Dr Arghya Sarkar, *Principal of Vidyasagar Metropolitan College* delivered the Welcome address.

2. **The Session -1 was designated for two consecutive invited talks.**

The first speaker was **Dr. Rajat Acharyaa, Professor, Department of Economics, Jadavpur University**. The brief introduction of Professor Rajat Acharyaa was given by Dr. Soma Saha, Joint convener of the seminar and Associate Professor in Economics, *Netaji Nagar College for Women*. Professor Acharyaa’s topic of presentation was **“Trade and Environment”**. He explained lucidly and interestingly the two way causations between international trade and the environment. How lax environmental regulation may lead to “perverse” comparative advantage through under-valuation of the environment, on the one hand; and larger trade shifts pollution load from one country to the other, on the other hand were nicely documented in his presentation with relevant data and evidences from the point of view of India and other countries. Participants, especially students of different colleges participated enthusiastically in the question answer session on Professor Acharyaa’s insightful presentation.

Our second guest speaker was **Dr. Ranajay Bhattacharya. Head of the Economic Division, Indian Institute of Foreign Trade, Kolkata**. Dr. Suparna Nandy (Pal), convener of the seminar and associate professor in Economics, *Vidyasagar Metropolitan*

College, gave a short introduction on Professor Bhattacharya's career and achievements. Professor Bhattacharya's topic of presentation was "***Global Value Chains and the Problem of Rules of Origin***". His lucid and insightful lecture with examples referring to India was thoroughly enjoyed by each participants which was evident from their active participation in question answer session. The entire question answer session for both the invited lectures was conducted by Dr. Bipul De, convener and associate professor in Economics, *Netaji Nagar College for Women*.

3. The Post lunch session was for *paper presentation* by students, scholars and teacher participants of different colleges. This session was chaired by **Prof. Debashis Majumdar, Department of Economics, The Heritage College, Kolkata**. Dr, Debasish Joddar, joint convener and associate professor in Economics, *Vidyasagar Metropolitan College*, gave a brief introduction about Dr. Majumdar's contribution in academics. There were six (6) selected scholarly papers (strictly on the theme / sub-themes of the seminar) to be presented. The researchers utilized this unique opportunity of presenting their research findings in front of the eminent academicians. Paper presenters got valuable suggestions from our respected chairperson of the session, Dr. Majumdar and other academicians regarding the scope of further improvement and /or expansion of their research papers. The post lunch session was very interactive and thought provoking.

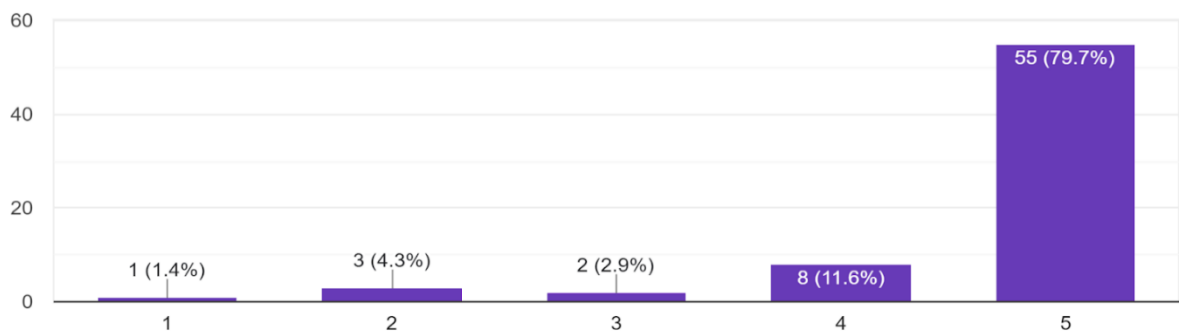
4. The last session was the valedictory session where formal vote of thanks was given by Dr. Bipul De, convener and associate professor in Economics, *Netaji Nagar College for Women* and certificates along with feedback forms were distributed among the paper presenters and participants.

Feedback of the participants

In most of the participants' opinion the seminar was well organised, informative and fruitful. Participants opined that the topic and theme of the seminar was very contemporary in present day's trade scenario. They benefited from the discussion which encouraged them for further researches on the topic. Participants mentioned that the outstanding speeches of both of the eminent speakers and the discussion of the eminent chair of the paper presentation session were immensely beneficial and engaging as well.

Registration for the seminar was fast and easy (1-strongly disagree, 5-strongly agree)

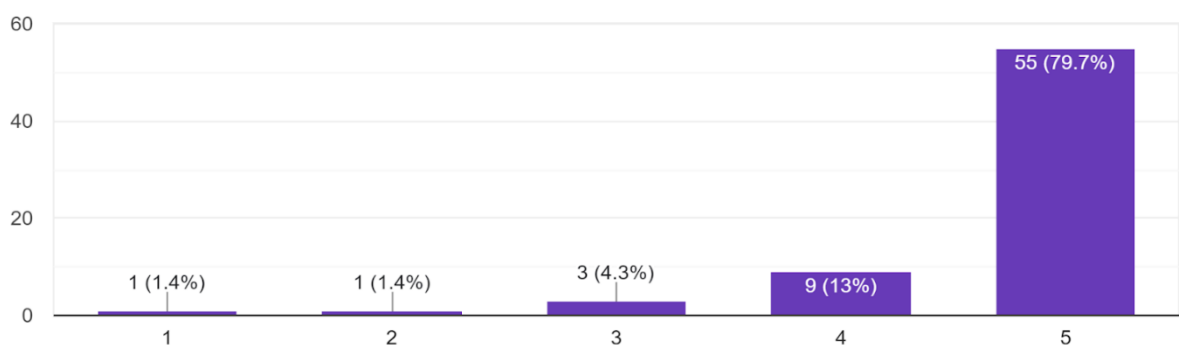
69 responses



More than 90% of the participants considered the registration process of the seminar as fast and easy.

The content was meaningful and relevant (1-strongly disagree, 5-strongly agree)

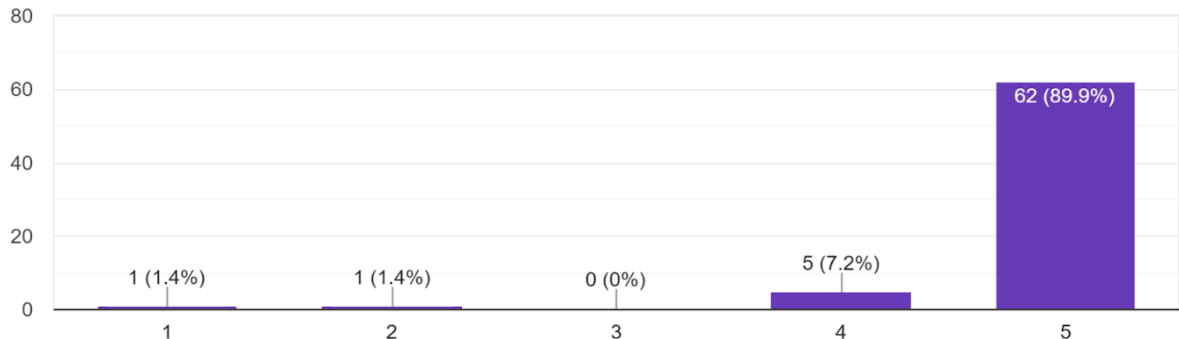
69 responses



More than 90% of the participants opined that the content and lectures were meaningful and relevant.

The speakers were knowledgeable, effective and stimulating (1-strongly disagree, 5-strongly agree)

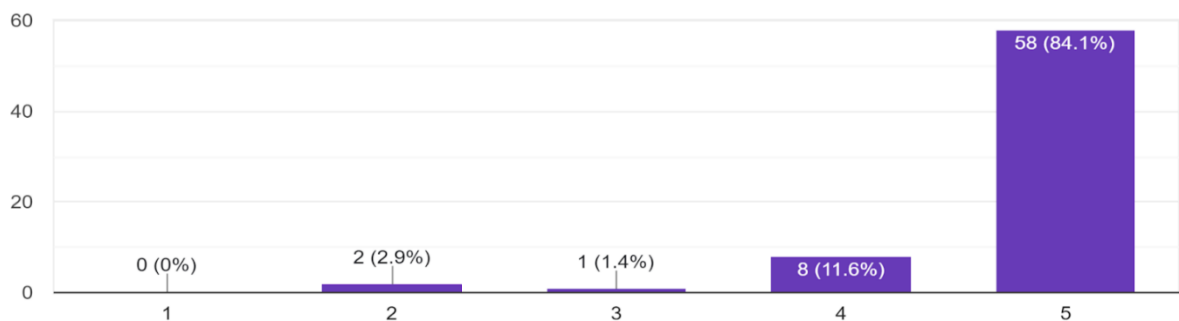
69 responses



According to more than 97% of the participants the speakers were knowledgeable, effective and stimulating.

The venue was comfortable, convenient and accessible (1-strongly disagree, 5-strongly agree)

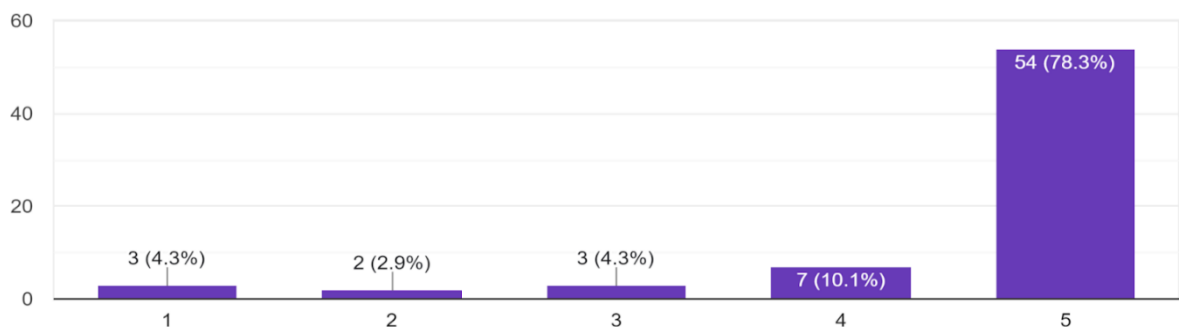
69 responses



More than 95% of the participants considered the venue as comfortable, convenient and accessible.

The catering was sufficient and tasteful (1-strongly disagree, 5-strongly agree)

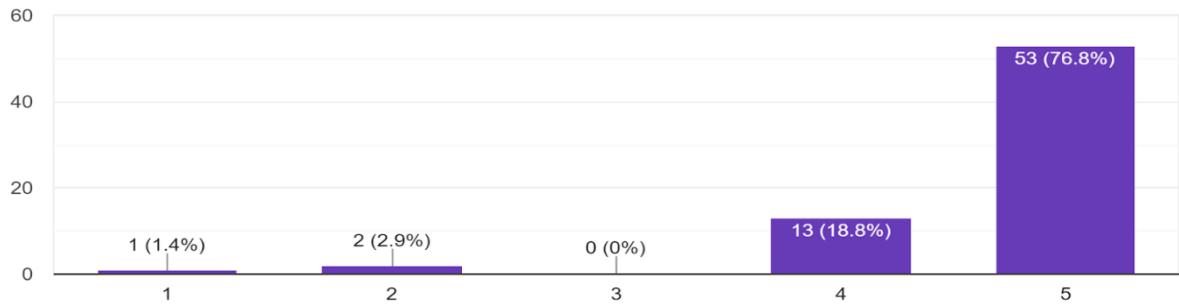
69 responses



Almost 90% of the participants were pleased with catering.

Please rate the overall hospitality (1-Very bad, 5-Very good)

69 responses



More than 95% of the participants acknowledged the effort of the seminar organising committee for their enhanced overall hospitality.

Recommendations and Suggestions

Recommendations and Suggestions from the National Seminar on "75th Year of Independence: Challenges and Opportunities for India in Global Trade", Jointly organized by Vidyasagar Metropolitan College, Kolkata-700006 & Netaji Nagar College for Women, Kolkata-700092 sponsored by ICSSR - ERC, Kolkata on 27/05/2023

Speakers and participants expressed their appreciation for the interesting perspectives on “75th year of independence: The Challenges and Opportunities before India in Contemporary Global Trade Scenario”.

Considering the discussions and insights from the seminar, the following recommendations and suggestions are proposed:

A. Global Value Chains:

1. Enhancing Participation in GVCs:

- Government:

- (i) Develop and implement national GVC strategies focusing on key sectors and promoting diversification.
- (ii) Facilitate access to finance for small and medium-sized enterprises (SMEs) to integrate into GVCs.

- Private Sector:

- (i) Invest in research and development to enhance competitiveness and upgrade technology.

2. Data and Analysis:

- Government:

- (i) Develop comprehensive and accurate data on GVC participation at the national and sectoral levels.
- (ii) Establish national GVC observatories to monitor trends and inform policy decisions.

B. Trade and Environment:

1. Sustainable Trade Policy:

- Government:

- (i) Integrate environmental considerations into trade agreements and negotiations.

(ii) Support the development and adoption of environmentally friendly technologies and trade in environmental goods and services.

2. Green Supply Chains:

- Private Sector:

(i) Implement environmental management systems throughout the supply chain.

(ii) Adopt responsible sourcing practices and ensure transparency in supply chain operations.

3. Capacity Building and Awareness Raising:

(i) Raise awareness among consumers about the environmental impact of their purchasing decisions.

(ii) Support research and development of eco-labeling and green certification schemes.

Suggestions:

- Human rights: Ensure that GVC activities respect human rights and labor standards throughout the supply chain.
- Innovation and technology: Encourage investment in clean technologies and innovations that support the transition to a sustainable and low-carbon economy.

By implementing these recommendations and suggestions,

We can unlock the potential of GVCs for economic growth and development while ensuring that trade is conducted in a way that protects the environment and promotes social well-being.

