

The Smart Megacity System of Indo-Pacific: Emerging Architecture and Megacities Studies



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Abstract In 2016 as per UN-HABITAT, there were about thirty-one gigantic cities/urban agglomerations/conurbations/megalopolises of population size ten million and above-called megacities in the universe which is likely to be 41 in 2030. Twenty million population and above cities are called meta cities which were eight in 2016 and will have eleven in 2030. Most of the megacities and meta cities are in the Indo-Pacific, amounting to a total of twenty-one out of 41 in 2030. They all form a close-knit and integrated system manifesting the spatial system of the global economy. Most newly emerging megacities built with newer industrial revolutions and technological basis are in the Indo-Pacific region. These megacities are functionally, spatially, and economically interconnected by sea and air routes and fiber-optic internet networks, generating daily economic interactions of great significance. The individual megacities in the system can be called wise to various degrees. Indo-Pacific region envelopes the boundary of the Indian and the Pacific Oceans, which are contiguous and most extensive of all oceans of the universe. The region can be called a combination of the homogeneous, program, and polarized regions for conducting various Indo-Pacific-specific designed economic activities and functions. These cities are genuinely global, work based on the ever-changing dynamics of global politics based on international diplomacy against national bureaucracy faithfully local the set of policies, programs, regulatory laws, and budgets of cities in the sub-national and below following a democratic pattern of governance with mixed economy or capitalist economy of various proportions, by largely local self-government in a Federal Governing setup such as in India, the USA or even to some extent Russia and China with autocracies in position. This local self-governance must be transformed uniquely to use the global megacity system's international and regional economic development. The Indo-Pacific megacity system is defined as an interconnected urban network functionally and economically by twenty-one megacities in the Indo-Pacific, servicing sub-national regions and servicing countries some thirty-one and above outside sharing the same megacity gateway physical infrastructure and related economic, institutional, and physical infrastructure of megacities of the Indo-Pacific. In this region, these megacities have a disproportionately

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higher NDP share as well as disproportionately higher average household income; they have distinct income and expenditure patterns than more miniature cities and villages of the respective Nations and assume a significant role in regional and international economic development and politics of the Indo-Pacific. In the Indo-Pacific region, all leading economies of the world are situated, such as the US, the People's Republic of China, India, Russia, Japan, Australia, South Korea, and ASEAN countries as well as SARC countries, and many other countries groupings. Others situated outside the Indo-Pacific, like France, the Netherlands, Germany, the UK, and the European Economic Community have substantial economic and security concerns in this region and long-term historical connections to the legacy of colonialization that connects them to the Indo-Pacific and have their independent National Strategies for the Indo-Pacific. Ships carrying goods and aero planes carrying Indo-Pacific persons of rare servicing capabilities and entrepreneurial force crisscross the Indo-Pacific every instant which also uses sea routes carrying many Trillion dollars' worth of manufactured goods annually a large world share and home for major fiber-optic internet cable networks of the world. These gigantic habitats are significant because it has all the potential to configure themselves into a system of intelligent and global megacities for their sustainability and rapid economic development, as well as collectively participating in major concerns like a war against the COVID-19 pandemic, other disaster management such as Tsunami, earthquake, forest fires, and floods, climate change issues and other security challenges like piracies and aggressions of certain countries for territorial expansion. This creative configuration of megacities into intelligent and global megacities resulted from two books, *Smart Global Megacities*, published by Springer Nature in 2021, through city case studies and edited by the author, articulating how such cities function. The vast population, cultural and ecosystem diversity, diverse institutional endowments, diverse political systems such as capitalist and socialist, and autocratic governing systems, supply chains connectivity, global linkages, and size of income and expenditure in these megacities create many opportunities for configuring an intelligent global megacity and then a system of smart global megacities which is the subject matter of this book. These two books mentioned above tried to understand the smart global nature of megacities and surveyed their growth, development, distribution, and distribution across geographic regions. Now this book explores further a single system of megacities in the Indo-Pacific. These cities are significant contributors to the Gross Domestic Product of their home nation. Theories of global cities are briefly studied and finally end up with broad approaches to configure these megacities into smart and global megacities systems sustainably based on the dynamics of international politics, which drives the dynamics of the worldwide economy. The second part of this book uses megacity case studies that specifically study the role of a few individual megacity cases in the megacity system of the Indo-Pacific. This chapter serves as a background for the Regional Development of Indo-Pacific area and several megacity case studies across countries in this book. This book is a continuation of the above two books, which looks at how these megacities, a sizable number in the universe located in the Indo-Pacific, work together as a system to promote an open, accessible, and prosperous region in the world for the next century.

Keywords Megacities · Smart Cities · Global Cities · Smart city configuration · Global city configuration · Megacity time series growth and distribution · Theories on global cities · Sustainable approach · Methodology for configuring megacities to smart and international cities · Megacity system

1 Introduction

This chapter introduces two parts, “Indo Pacific System of Megacities: Emerging Architecture” and “Indo Pacific System of Megacities: Megacity Studies,” which are the outcome of international collaborative research to explore the art and science of Indo-Pacific megacity system-based Regional Development. The Indo-Pacific region is a diverse multi-countries region culturally rich with an ancient civilizational long history, willing to collaborate for their welfare and economic development as well as collectively attempt to ensure their security against aggression, terrorism, piracy, corruption as well as natural disasters like Tsunami, floods and earthquake and pandemic like the COVID-19 as a collective effort. The Indo-Pacific Economic Framework has already brought together thirteen countries among forty of these regions on the first day it was introduced by the US President on May 23, 2022, in Tokyo during the fourth QUAD Summit. It will be signed after due discussion, deliberation, and dialogue in the next year. This region, undoubtedly global, will develop the path of prosperity. This country’s grouping is only next to the United Nations Assembly and much larger than the European Union and G20 Nations. Countries outside the Indo-Pacific, France, Germany, the Netherlands, and the European Union have their Indo-Pacific country policy, strategies, and guidelines to pursue engagement on a long-term basis with the Indo-Pacific region to collaborate and engage actively. India, the US, Australia, Japan, and even those reluctant to join Indo-Pacific Russia conducted two by two dialogues with foreign and defense ministers of India between these countries. Comprehensive trade deals recently enacted exist between India, Australia, and India UAE, with India and the European Union and India and India US under-speed track. On behalf of Indo-Pacific, the US, Japan, Australia, and India have met twice virtually during COVID-19 days and twice in person in Washington and Tokyo for the summit and will again meet in the next summit in Sydney in 2023. These meetings resulted in the formulation of joint actions with individual responsibilities of each of the four countries identified and now moving toward program implementation. In this digital age, the QUAD with the US, Japan, Australia, and India collectively, as an effort of diplomats and many think tanks working groups, formulated Indo-Pacific programs and Indo-Pacific Economic Framework, with no brick-and-mortar office, Governing institution, and their Indo-Pacific bureaucracy deliberately. A look at global and world cities theories, summarized later in this chapter, shows no idea that the global megacity system region exists. The benefit of Indo-Pacific regional global city system-based development is directed to people in the collaborating countries and outside since the region is externally linked with the

rest of the world. For example, STEM Educational fellowship in the US universities for one hundred students programs Indo-Pacific is open to individuals. The two billion Vaccination against COVID-19 can be implemented in collaboration with the QUAD leading countries and some selected offices of the public healthcare system as deemed helpful by QUAD as the most suitable to individuals in person in the Indo-Pacific region.

In contrast, QUAD countries have sent Vaccines to many countries outside, as well as the maritime surveillance program and anti-corruption drives. A closer study of citizen rights and responsibilities in the constitution of Indo-Pacific region as against existing institutional, terms of reference, citizens individually and organized as a community spatially or in cyberspace as districts has been given more rights than institutions to participate in the march of the global region toward prosperity which will be dealt with in the conclusion of this chapter. The underlying thrusts of the Indo-Pacific are to disseminate emerging technologies with supply chains and standards such as 5G and 6G, Industry 4, related space technologies, renewable energy technologies, and a green economy to benefit humanity, save from climate change, and more resilient supply chains for any eventuality such as war and climatic calamities and to enlist the participation of Indo-Pacific region on the path of prosperity. Climate change, disasters such as tsunamis, floods, pandemics, and security arrangements for aggression, piracy, unauthorized fishing, and corruption are essential to Indo-Pacific and programs that address marine and space and cyber surveillance. There are also military alliances, such as AUKUS, which is beyond the scope of this book.

In all countries, urban economies have a maximum share of NDP, and cities of larger sizes trigger the growth of NDP since they are natural leaders of the urban system. These cities sustain clean air, water, physical, social, and economic infrastructure, and by-products and services provided by people in adjacent cities, villages, and countries, manifesting international cooperation as a daily reality. The larger the cities, the more collaboration with more countries, cities, and villages, and if such large cities exist in one area, all these cities also interact with each other through communication, travel, goods movement, and money flow. Most Start-ups and Unicorns are located selectively in certain megacities such as Bengaluru in Karnataka in India, Los Angeles in the US, and Shanghai in China. At the same time, the US, China, and India have unicorns, the maximum number in the world, and all of them in Indo-Pacific. These cities have high per capita income and good purchasing power, making them the first market for innovative products and services. Access to megacities by air, road, sea, and railways is better than other cities in the world, and these megacities also have better.

Interconnectivity within themselves, expanding the market for goods and services, and triggering the economic multiplier is also significant if the strategy of using these megacities as a system is in totality.

These megacities are also connected with other megacities outside the region serving all countries with independent Indo-Pacific strategies, such as the European Union, France, Germany, the UK, and the Netherlands. To sustain the existing reality between Indo-Pacific and the outside, some leading countries with high GDPs want to develop a relationship with potentially high-growth areas in the Indo-Pacific.

In 2004, Australia, India, Japan, and the United States came together to manage the humanitarian assistance and disaster relief efforts in the aftermath of the 2004 Indian Ocean earthquake and tsunami. This group focused on this narrow mission in 2004 and ceased Quadrilateral engagement after the Tsunami response but continued to persist as an idea among strategists. By 2006, then-Prime Minister of India, Manmohan Singh, on a state visit to Japan with his newly elected counterpart, Prime Minister Shinzo Abe, noted, in a joint statement, the “usefulness of having dialogue among India, Japan and other like-minded countries in the Asia–Pacific region on themes of mutual interest.” With the United States and Australia making up these “other like-minded countries in the Asia–Pacific,” the QUAD was born.

By 2007, the QUAD had two components. The first was diplomatic—an informal meeting of officials from all four countries on the sidelines of the East Asia Summit in Manila. The second was military—a joint exercise involving all four countries, as well as Singapore, under the aegis of the then-bilateral US-India Malabar Exercise (Japan, Australia, and Singapore were invited as “non-permanent partners” in 2007. MALABAR was officially upgraded to a trilateral exercise in 2015 when Japan became a “permanent partner.” However, by 2008, the QUAD was dormant, partly because domestic political compulsions forced the countries to take a step back from the QUAD. Prime Minister Singh faced backlash from his domestic political alliance over growing US-India ties and the QUAD. However, the QUAD was put down after Australian officials, sensitive to China’s vocal concerns over the QUAD, declared that they “would not be proposing to have a dialogue of that nature” again. In the years since, the idea of resurrecting the QUAD has continued to linger, gaining speed in recent years through various bilateral and trilateral mechanisms. The rise of China and its increasingly assertive behavior, which has threatened the critical interests of all four countries, has also given additional impetus to restart the group. On Nov. 12, 2017, an entire decade after the first informal meeting of the QUAD, the four countries announced that officials from all four countries had met to discuss “issues of common interest in the Indo-Pacific region.”

1.1 Peace and Prosperity in the Indo-Pacific: [1–4]

Indo-Pacific is a vast region forming two oceans and is under the self-appointed leadership of QUAD. The fundamental concept behind the Indo-Pacific System of Megacities requires elaboration (Fig. 1).

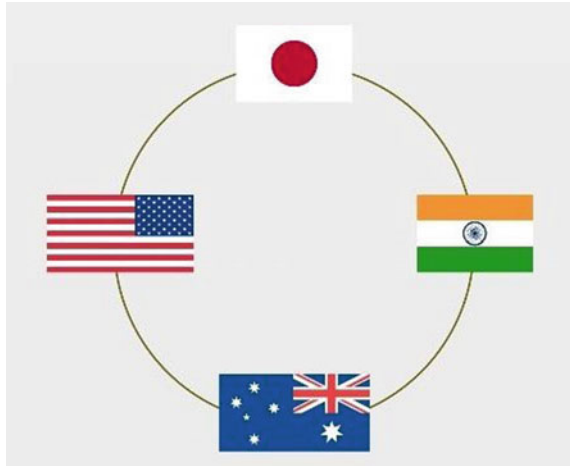
The term ‘Indo-Pacific’ is being used increasingly in geopolitical discourse. Many analysts sought to describe the ‘geo-economic’ connection between the Indian and Pacific Oceans. However, in the contemporary context, in the 2000s, analysts began to observe the ‘security’ linkage between the two Oceans. From about 2011 onwards, the term has been used frequently by strategic analysts and high-level government/military leadership in Australia, Japan, and the US to denote said region. The term ‘Indo-Pacific’ refers to the maritime space stretching from the littorals of East Africa and West Asia, across the Indian Ocean and the Western Pacific Ocean, to the littoral

Fig. 1 Oceans of the World, and the Asia–Pacific and Indo-Pacific Regions. *Source [5]*



of East Asia. It is much bigger than the Asia–Pacific, which leaves out the African east coast as the economic leader of the next century. The spirit of the term was picked up by Japan’s Prime Minister Shinzo Abe, as reflected in his speech to the Indian Parliament in August 2007 that talked about the “Confluence of the Indian and Pacific Oceans” as “the dynamic coupling as seas of freedom and prosperity” in the “broader Asia.” From 2010 onwards, the term Indo-Pacific acquired salience within the Indian government and has since been used often by India’s apex political leadership. It is also “symbiotically linked” with the Quadrilateral Security Dialogue—an informal

Fig. 2 The QUAD core countries



grouping of like-minded democracies in the region, comprising Australia, Japan, India, and the US (Fig. 2).

In 2019, the US State Department published a document formalizing the concept of a “Free and Open Indo-Pacific,” to be sustained among members of “the QUAD,” a partnership of four Indo-Pacific democracies led by the United States, in concert with Australia, India, and Japan. ‘Indo-Pacific’ has also featured prominently in top-level US strategic documents such as the 2017 National Security Strategy, the 2018 Nuclear Posture Review, and the 2018 National Defense Strategy. It has been argued that the concept of the Indo-Pacific may lead to a change in popular “mental maps” of how the world is understood in strategic terms. In 2013, US officials began using the word “Indo-Asia Pacific,” which enabled America to maintain its geographic inclusiveness in the new Indo-Pacific coinage (Fig. 3).

The economic aspect of Indo-Pacific is summarized in the following Map.

It has its share of natural disasters, as shown in the figure below. India, the USA, Japan, and Australia came together in 2004 to aid people in the region most affected by the Tsunami, which was the beginning of these four countries coming together (Fig. 4).

The term’s importance was raised when it found mentioned in the joint statement issued by Indian Prime Minister Narendra Modi and US President Donald Trump after the former’s state visit to the White House on June 26, 2017. “As responsible stewards in the Indo-Pacific region, President Trump and Prime Minister Modi agreed that a close partnership between the United States and India is central to peace and stability. In marking 70 years of diplomatic relations between India and the United States, the leaders resolved to expand and deepen the strategic partnership between the countries and advance common objectives. These objectives include combating terrorist threats, promoting stability across the Indo-Pacific region, increasing free and fair trade, and strengthening energy linkages.” However, President Trump’s November 2017 articulation on Indo-Pacific was widely seen as something that would



Fig. 3 Indo-Pacific status of selected attributes concerning the world. Source [6]

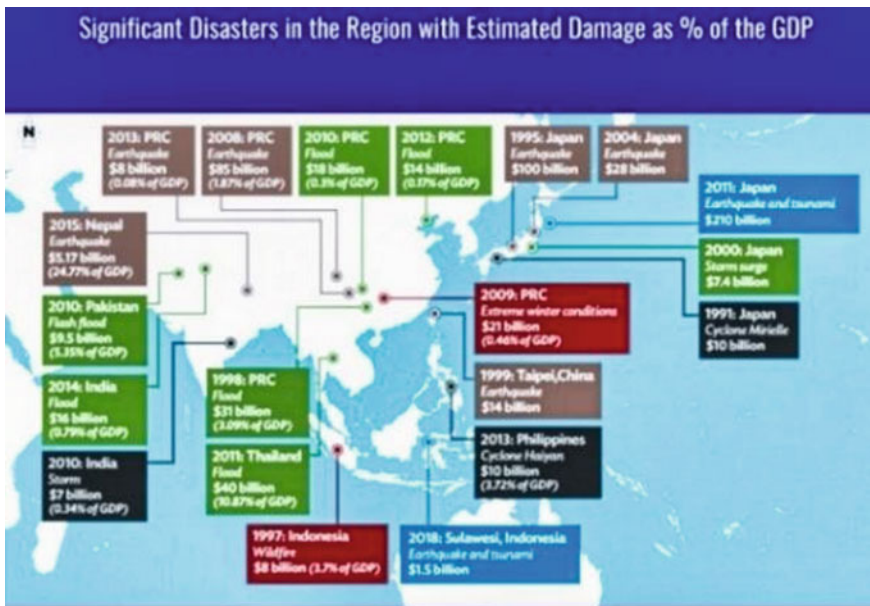


Fig. 4 Disasters in the Indo-Pacific. Source [6]



Major Milestones of Indo-Pacific Regional Development are summarized in the Table 1.

Indo-Pacific is a connected region with several connectivity types in the figure below. This region is interconnected and accounts for a significant part of global trade. Connectivity can be of two kinds. One is physical connectivity, such as seaport, airport, railway, and highway connectivity. Another connectivity creates additional access within the landlocked servicing countries and subregions of individual megacities, some twenty-one subregions (Table 1).

However, the overall connectivity of the Indo-Pacific is not satisfactory now and requires additional infrastructure augmentation as per emerging practical other demands. The creation of overcapacity and the capacity of infrastructure are equally bad. Creating overpower, as in the case of many existing ghost towns in China and Sri Lanka, not so well-planned new towns, airports, and harbors can lead to the economic

Table 1 Indo-Pacific key milestones

Year	Major milestones of Indo-Pacific regional development
2007	Japanese Prime Minister Shinzo Abe calls the Indian Ocean and the Pacific Ocean shared space in his speech “Confluence of the two seas” in New Delhi
2011	The US secretary of State Hillary Clinton speaks of the Indo-Pacific in the context of the pivot of Asia
2012	The Indo-Pacific appears for the first time officially in the White paper Australia in the Asian century
2015	The document ensuring secure seas Indian maritime security strategy makes use of the word Indo-Pacific
2016	Shinzo Abe declares his “free and open Indo-Pacific Strategy to be the core of the Japan’s foreign policy doctrine.”
2017	At the APEC summit in Da Nang US, President Trump calls the “Free and Open Indo Pacific” the focal point of US Asian Policy
	The national security strategy of the United States dedicated a special section to the “Free and Open Indo Pacific”
2018	French President Emmanuel Macron speaks about a French Strategy for the Indo-Pacific
	Indian Prime Minister Narendra Modi presents his country’s view on Indo-Pacific Concept in his speech at the IISS Shangri-La Dialogue in Singapore
	Japan, from now on, calls “Free and Indo-Pacific” a vision rather than a strategy
2019	The French Defense Ministry publishes the strategy paper France and Security in Indo-Pacific
	At the summit in Bangkok, the ASEAN states agree on a joint document ASEAN. Outlook on Indo-Pacific
	The US Department of defense publishes the Indo-Pacific Strategy Report. Preparedness, Partnership, and Promoting a Networked region
	The US Department of State publishes the strategy paper A free and Open Indo. Pacific Advancing Shared Values
2020	Germany announces its Indo-Pacific strategy
	The Netherlands issues “Indo-Pacific Guidelines for strengthening Dutch and EU cooperation with Partners in Asia
2021	In April 2021, the European Union (EU) released the ‘EU Strategy for Cooperation in the Indo-Pacific,’ a document outlining a cooperation plan with the Indo-Pacific
	Prime Minister Shri Narendra Modi attended the first in-person QUAD Leaders’ Summit in Washington D.C., USA, on 24 September 2021, along with Prime Minister Scott Morrison of Australia, Prime Minister Yoshihide Suga of Japan, and President. Joseph Biden of the United States of America
2022	On February 11, the White House announced its new strategy for a “free and open. Indo-Pacific” region, which pledges support for regional connectivity, trade, and investment, and deepening bilateral and multilateral partnerships
	Prime Minister participated in a virtual summit of QUAD leaders, along with US President Joe Biden, Australian Prime Minister Scott Morrison, and Japanese Prime Minister Fumio Kishida

(continued)

Table 1 (continued)

Year	Major milestones of Indo-Pacific regional development
	The second in-person and the fourth summit of the Quadrilateral Security Dialogue, or QUAD, hosted by Japan as early as 23–24 May 2022 against the backdrop of pledges by the leadership of India, Australia, Japan, and the US to forge ahead with efforts to ensure a free and open Indo-Pacific and announced Indo-Pacific Maritime Domain Awareness, among QUAD fellowship, Advanced technical standards, cyber security, critical emerging technologies, infrastructure with \$ 50 billion, and Disaster. relief
	With thirteen initial member countries, Indo-Pacific Economic Framework came up for discussion by Indo-Pacific democracies
	The US Indo-Pacific Strategy February 2022
	Joint Statement of the Leaders of India, Israel, United Arab Emirates, and the United States (I2U2)., July 14, 2022
	Indo-Pacific Strategy of Canada announced in November 2022
2023	The fourth summit of the Quadrilateral Security Dialogue Tokyo
	The fifth summit Quad Leaders’ Joint Statement 20 May 2023, Hiroshima

Source Author

collapse of Nations. A policy of timely creation of additional infrastructure capacity to be an adequate and marginally higher degree in tune with growing demand is necessary to avoid the cost of congestion (Fig. 7).

The other type of important connectivity is institutional connectivity, in which nations are connected for common goals and objectives by treaties, covenants, and agreements. Such institutional connectivity for the Integrated Megacity System for the spatial, social, and economic development of the Indo-Pacific does not exist for collective implementation anywhere. Institutions require bureaucracy, and complex bureaucracies with complex administrative procedures often tend to be a drag for the speedy performance of regional development. It is best to be done by an open and free-market mechanism and implementation agency directly plan and implement avoiding lengthy multi-administrative procedures creating more corruption, and less efficiency and cost escalation including an administrative expense. As an example, India-centric institutional connectivity is shown below in the diagram. An example of the creation of a market-oriented and crowd-funded international airport in the megacity of Kochi is the one well-functioning and profit-making and innovating cum solar energy run airport of Kochi in Kerala, India as against airports under government such as Kozhikode and Thiruvananthapuram airports in Kerala, its growth, performance, and profitability despite increasing demands.

There exists similar connectivity among all other countries of QUAD. Some are for collective security through defense forces, and others for economic development and social welfare (Fig. 8).

Peace and prosperity are the goals of the Indo-Pacific. These two goals do not require any lobbying to make them acceptable to all countries of the Indo-Pacific region. However, the four countries, Japan, the USA, Australia, and India, made it



https://csis-website-prod.s3.amazonaws.com/s3fs-public/190409_figure1_web.jpg

CSIS Reconnecting Asia Project, <https://reconnectingasia.csis.org/map>

Fig. 7 Spatial connectivity of Indo-Pacific

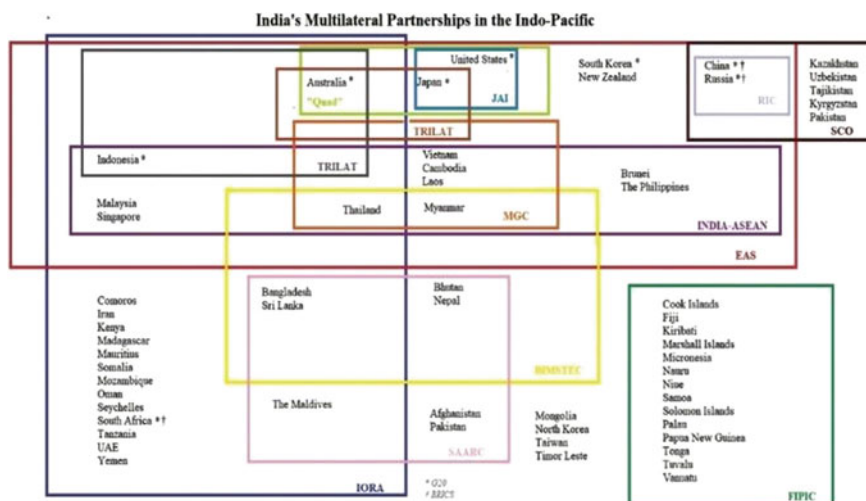


Fig. 8 Institutional connectivity of the Indo-Pacific. Source [7]

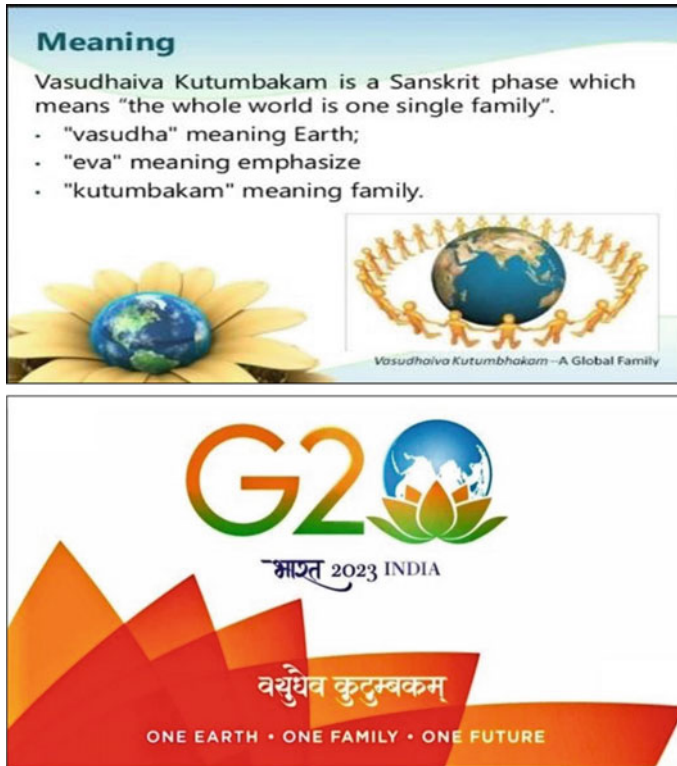


Fig. 9 Vasudhaiva Kutumbakam the Indian Concept of the Universe. *Sources* Maha Upanishad and Government of India

their task to follow the peace and prosperity goals comprehensively in the Indo-Pacific. The Indo Pacific regional concept is based on the Indian concept of God's family or Vasudhaiva Kutumbakam (Fig. 9).

Indian origin religions such as Hinduism and Buddhism in many forms such as Saivism, Vaishnavism, Mahayana, and Theravada Buddhism with many schools and Vedanta and Vashist Advaita and Dvaita the duality school, and the resulting culture, adaptive arts, and way of living is the foundation of the culture of most countries in this region overlaid with layers of Christianity a colonial legacy or Islam through merchants later. It changed very marginally the initial culture and the way of living of the majority of nations in the Indo-Pacific. As the author did, it will be evident if one lives in many countries. They all believe in the concept of a global family. Therefore, there was no difficulty in evolving the Indo-Pacific Regional Development for peace and prosperity through this concept.

As a result, the Indo-Pacific is a diverse area around the Indian and Pacific oceans, the largest of many seas in the world. Peace in this region is a prerequisite to continuing the path of prosperity.

Peace is an absence of war. The security of peace in the Indo-Pacific is impossible without complete preparation.

For war from now onwards in the best workable way by countries of Indo-Pacific individually and collectively.

Outer space, cyberspace, sea, and land, with their unique topography, climate, and choking points, are domains of war. War is not mere fighting of soldiers but multi-faceted, such as cyber war, AI-induced war, economic sanctions, and war with physical obstruction to ships, airways, and the internet. Finding strategies and means that ensure massive deterrence is considered sufficient to ensure peace. These need to be formulated by countries individually and collectively, emphasizing the individual. Stability is also created by the ability to have diplomatic dialogues. The best practical way is to develop collective defense intelligence of the sea such as five eyes, land, outer space, and cyberspace in the Indo-Pacific, which is being started by QUAD countries, alliances, and partners of the Indo-Pacific, for example, NATO alliance of Japan, South Korea and AUKUS the US, the UK, and Australia. History has shown that large countries such as the USA were defeated by small countries like Vietnam or Afghanistan in wars, which gives hope of winning a war by small countries even against superpowers. The war was against the Taliban and Vietnamese, respectively, and to defeat them, but in the end, the Taliban or Vietnamese came into power in the respective countries. This shows that small and less wealthy countries with less economic and defense capability can also win wars. Prolonging the war, as we see in Ukraine, is resulting in large-scale destruction of cities, deaths, disability, and injury to many people, and displacement of the large-scale population by outmigration, temporary or permanent, without giving diplomacy and dialogue a chance. These culminate in a worldwide recession and scarcity of essentials (Fig. 10).

Two large armies supported by Airforce and the Navy are face to face and eyeballed in the Western Himalayas for two years and above in the worst climate, but the war has not occurred on a full scale. India and China are alone, with no armies stationed on the border other than these two. Here diplomacy and talk between defense forces are given a chance with an unpredicted outcome. This is far better

Fig. 10 The five eyes



than the prolonged warlike in Ukraine. The Ukraine war is not a good example to follow for the Indo-Pacific.

The book's central theme is not the collective security of the Indo-Pacific but the prosperity of all in the Indo-Pacific and sharing a common future. This book focuses on people, their life, work, welfare, and wealth, and any war that causes hardship to people is not acceptable to Indo-Pacific. Other means, discussed briefly above, such as diplomacy and deterrence, are advocated. This book aims not to elaborate on the security aspect but to mention that Indo-Pacific security is the uniting factor for countries in the Indo-Pacific and their city system-based Regional Development.

1.2 A Free and Open Indo-Pacific

1. A target of **Free and Open** Indo-Pacific is a goal of QUAD for achievement. Freedom of movement of goods through container ships accounts for a significant share of the international trade in the Indo-Pacific, which is the lifeblood of the global economy. Some belligerent countries in this region have been aggressive by salami-slicing other countries' sovereign territories and almost prevented such international goods traffic and trade by building artificial islands with defense infrastructure. Preventing such barriers to international trade is the Indo-Pacific's primary security goal, which will be elaborated on in another chapter of this book. This behavior requires capable self-defense and massive deterrence giving way to lasting peace in the Indo-Pacific. Many countries interested in the Indo-Pacific are nuclear-armed, such as the US, China, Russia, India, Pakistan, North Korea, the UK, and France. Some have a sizeable army, navy, air force, and experience, having fought many battles in the last century. Some of them have hypersonic and space warfare capabilities and cyber warfare capabilities. Some others, even today, keep some 100,000-army face-to-face and eyeball to eyeball preventing salami-slicing of Himalayas. In the Indo-Pacific, a group of countries' defense forces can use other countries' facilities and services. Some groups of countries have executed periodic war game exercises. These countries have also conducted innumerable dialogues and diplomatic interventions in the past, avoiding full-scale war. Some counties have formed AUKUS Australia, the UK, and the US defense treaty by transferring nuclear-powered submarine technology and trying to place submarine forces with lethal weapons in the Indo-Pacific to ensure freedom of movement. Indo-Pacific is not a group of countries like NATO with defense cooperation that says any aggression toward any one country will be aggression to NATO, and all these countries will come into a war if attacked. There are US allies like South Korea, Australia, Philippines, Japan, and collaborators like India and other countries who do not have alliance treaties with NATO and have no such future intentions.
2. Free and Open Indo-Pacific also have a developmental connotation. They are given below.

Countries in the Indo-Pacific are free to hold independent foreign policies and military and commercial relationships. For example, despite the two armies of India and China standing face to face in the Himalayas, there has been a rise in the trade percentage from one hundred billion to 130 billion in the year 2022. However, the US-China economic relationship is facing sanctions and restrictions by tariffs. There have been dialogues between some of these countries and implementing certain sanctions that do not allow foreign direct investment in India or buying products and services such as 5G and telecommunication infrastructure from China for security reasons. India and Russia have long defense cooperation, including joint manufacturing of defense products such as Brahmos supersonic missiles. On the other hand, some countries in the Indo-Pacific have sanctions imposed because of the Ukraine war.

3. Freedom of easy movement of people for commerce, education, health care, and tourism of various kinds is needed for regional economic development. This can be eased by eVisa and less complicated visa rules that quickly help the movement of people within the region. However, some countries have such facilities many countries of the Indo-Pacific need to embark on these initiatives.
4. Freedom of easy transfer of money. Indian Rupee is an accepted currency in certain countries such as Bhutan, Nepal, and Singapore. In India, the digital transfer of funds by the Unified Payment Interface (UPI) has replaced significant cash transactions. UPI is.

Gradually spreading in a few countries in the Indo-Pacific, such as the UAE, Australia, and Nepal, and Russians are considering its acceptability. SWIFT is another US dollar-centered mode of dollar transfer through messaging. There needs to be a liberalized regime of all types of electronic money transfers using smartphones in all countries of the Indo-Pacific.

5. Freedom to easily migrate to the Indo-Pacific countries for studies, work, and business. A start-up in one country requires a partner in another country who wants to migrate into a third country that can better nurture and evolve the start-up into a Unicorn, which should not be bogged down by migration-related bureaucracy. They should experience the least amount of time in the administrative process, and most of the process could be executed on the website or smartphone without visiting the respective embassies.
6. Freedom to get skills in demand and advanced degrees from universities free of cost to students of the Indo-Pacific. The Indo-Pacific Regional Development is based on advanced technologies such as ICT, IoT, 5 G, 6 G, AI, Block Chains, and Industry 4. This requires all countries to have a sizeable population with relevant skills from universities that impart high-quality education such that advanced knowledge on science, technology, and mathematics are available as per demand to drive emerging technology-based Indo-Pacific regional economic development. Although the US, India, Japan, and Australia have limited scholarship programs, they are not widespread and highly limited in scope to all countries in the Indo-Pacific. The best way to make high-quality university education imparted in Indo-Pacific is to make it accessible so that all students in the

Indo-Pacific, regardless of nationality, income, religion, caste, or class, have easy access to free education.

7. Of the twenty-four countries that provide free education, sixteen are based in Europe, and one is in North America. It is rare in Asia. Three countries in South America and three in Africa also have this provision.

Europe

Norway: Tuition is not only reduced or free for citizens but also for international students. Taxpayers' money covers attendance at state universities, but higher living expenses are a negative issue for international students.

Sweden: Although previously offered to all students, their tuition is now free to citizens and European students. There was an increase in scholarship programs to compensate, but they were not remarkably effective.

Germany: Some universities have recently begun charging some tuition fees, but most still offer free education to all students, even international students. They may ask for a small contribution each semester, but it is nowhere near the total tuition price.

Denmark: All Danish citizens are offered scholarships and aid, but most colleges are free. They offer their programs to citizens, European students, and students with certain visas.

Finland: Finland is a country that offers completely free education and only charges fees to non-European students that wish to take classes in English. Living expenses are not covered.

Austria: Not a tuition-free country, but remarkably close. Tuition and school fees are meager for citizens and European students, with a slight increase for non-European students.

Greece: Free education is available for citizens of Greece and European students; international fees are meager compared to regular tuition fees in other countries.

France: Not free, but exceptionally low. If one is native to France or Europe, one will only pay a few hundred euros. International fees do go up to thousands per year.

South America

Uruguay: Education is accessible to all Uruguay citizens. It does not extend to European or non-European students.

Brazil: University-level education is accessible even to international students. All classes are in Portuguese as they do not offer English.

Argentina: Free education is only offered to Argentinian students and citizens; it is not available for international students.

North America Panama: Accessible to all students, with no concern for nationality. That includes citizens, Europeans, and all international students.

Asia

Malaysia: Free tuition is uncommon within Asia; free education is only available to Malaysian citizens.

Africa Morocco: Free tuition to all citizens but does not outreach to international students. Egypt:

Also, only free tuition for all citizens, but not for international students. Their programs are meant to decrease poverty within their country.

Kenya: Unlike other African countries, they allow free education for citizens and international students. International students are limited to public tuition if they are high-scoring secondary school students.

Countries in the Indo-Pacific shall develop self-sustaining ecology of high-quality university education at a near-zero marginal cost to students. Greenfield or Brownfield, such as an Indian Institute of Technology, is free education. This requires a system to make the marginal cost per student near zero through various possible strategies.

1. Zero healthcare costs to the population shall be implemented in the Indo-Pacific. It is crucial to have a healthy population for regional economic development. Since all countries of the Indo-Pacific are not high- or middle-income countries, it is essential to make health care universally accessible and free to all. Marginal cost-based country-specific design can be researched.

Forty-three countries in the world offer free or universal healthcare. However, the standards among these countries can vary widely. The list includes everyone from Norway, one of the healthiest countries in the world and the first country to introduce free healthcare in 1912, to another extreme case in Yemen, where raging conflict has made health care from international relief agencies impossible to access.

List of Countries Offering Universal Health Care Systems

Not all citizens or residents receive free healthcare in all these countries. In many of these countries, employers and individuals share in the cost of healthcare through contributions, cost-share arrangements, co-pays, and other related fees. However, these programs aim to make health care as affordable and accessible as possible for the most significant number of people—“Universal Care.”

Countries With Universal Healthcare are Australia (Healthcare Systems in Australia and Austria), Bahrain, Belgium, Brunei, Canada (Canadian Health Care System), Cyprus, Denmark, Finland, France (French Healthcare System), Germany (German Healthcare System), Greece, Hong Kong, Iceland, Ireland (Healthcare System in Ireland), Israel, Italy (Healthcare System in Italy), Japan (Japanese Healthcare System), Kuwait, Luxembourg, Netherlands, New Zealand (New Zealand’s Healthcare System), Norway, Portugal (Healthcare System in Portugal), Singapore, Slovenia, South Korea, Spain (Healthcare System in Spain), Sweden (Sweden’s Healthcare System), Switzerland, United Arab Emirates, and UK (Healthcare System in the UK).

1.3 Indo-Pacific Subregions

Before we look at the megacity system of Indo-Pacific, we need to consider the Indo-Pacific region, which is the spatial home of the megacity system of the Indo-Pacific. Chapter 2 of emerging architecture will spell out and identify this region, and Chapter 3 will go into more detail about the components of this region. Without going into the specific outcomes in that chapter, the regional concept, the basis of their work, identifies first all megacities in the Indo-Pacific and then investigates the influence region of megacities. Megacities have distances between them. When one is spatially partitioning these individual megacities, then one gets the subregions of the megacities. Suppose one studies the landlocked and other adjacent countries that use these megacities as their gateways to the Indo-Pacific for international trade. In that case, one gets the servicing countries of the Indo-Pacific Megacity System. The subregion of individual megacities and the servicing countries constitute the Indo-Pacific subregion, the geographical space for integrated development. If one draws a boundary of these spatial components of the Indo-Pacific, we get the Indo-Pacific region.

1.3.1 Indo-Pacific Homogenous Subregions

The region is homogeneous such that the area has common developmental issues. If development issues and their solutions are expected, then the answer can be applied to these homogeneous regions without looking at each case as exceptional (Fig. 11).

After defining the region, the next question is how to enact regional development of the Indo-Pacific and how to integrate it. For example, the Indo-Pacific is home to innumerable islands, as shown in the figure. Islands are susceptible ecologically and culturally, and developmental activities, including the building up essential infrastructure, require great care keeping in view the impacts, which is not the case in other areas. For example, removing sand from the island beach is a prescription for water to invade the very scarce island land. Pumping more water using a high-power pump can draw saltwater instead of potable water. The expertise in mindful ecology for regional development is more important than mindless economics. Another issue for island communities is access to megacity gateways. There is a need to break into the transport system using multiple types of ships requiring birthing facilities. Even though the islands of the Indo-Pacific look the same geographically and ecologically, they fall into different climatic zones. Agriculture changes with climatic zones. The agricultural technology requirements in these regions can also change. Therefore, connecting these agro-climatic zone-based islands to specialized and relevant farm research and extension centers in different countries may be the best first step to embark on regional development using island communities' high-tech and advanced intelligent agriculture.

There can be many more homogeneous subregions, such as low-income, middle-income, and high-income regions. They can have a different program or project



Source: Map prepared by Hannah Fischer and Amber Wilhelm with CRS.

Notes: There are different definitions of the geographic scope of the Indo-Pacific region.

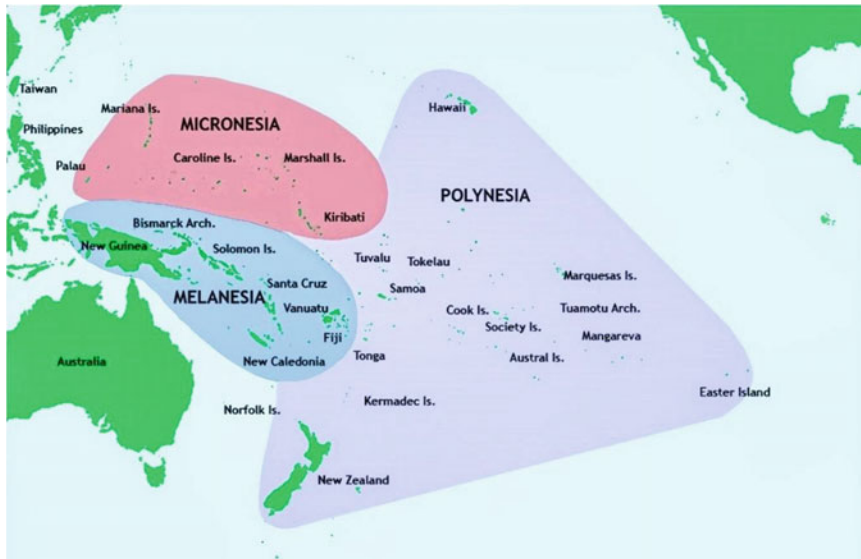


Fig. 11 Indo-Pacific region with small island details

region in the Indo-Pacific. There can also be regions worst affected by disasters, such as tsunamis, and middle and least affected by disasters. They can be classified, mapped, and then evolved appropriate projects/programs of action suited to them. As we know, the effort required by programs Indo-Pacific is specific and related to the characteristics of the subregions. Therefore, the agenda of the Indo-Pacific needs

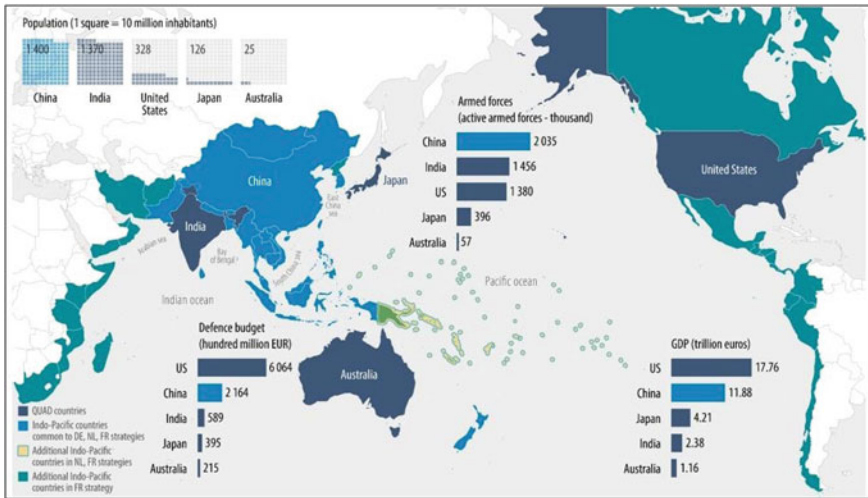


Fig. 12 The Indo-Pacific as defined in strategies from France, Germany, and the Netherlands

to be formulated to the homogeneous and region-specific to make them minimal risk and workable.

In addition, it is essential to present the economic and defense might of major countries of the Indo-Pacific documented in the following map (Fig. 12).

1.3.2 Indo-Pacific Program Subregions

These homogeneous subregions can be the appropriate program regions of the Indo-Pacific, first based on the homogeneous regions' specific needs, say for earthquakes or other disasters. Management or economic development needs based on Gross National Income or and second, where such need-based appropriate Indo-Pacific Program of action protocol is feasible to implement (Figs. 13 and 14).

As we know, Indo-Pacific Programs are discussed and formulated comprehensively. The example COVID-19 vaccination program in the Indo-Pacific considers selecting appropriate vaccine technology, it is financing, patents, manufacturing, cold-chain logistics, last-mile implementation, and many other components by the working groups of QUAD leading countries, the US, Japan, Australia, and India through dialogue, and discussion and implemented in the Indo-Pacific with no constitutionally sanctioned institution such as like the European Community Parliament or Administration which is installed above hierarchically many countries in the Indo-Pacific.

Barring a few, many of the countries in the Indo-Pacific are democracies that follow a rule-based system. Others are autocracies like North Korea or China, where the final word of all things lies with its supreme leader. Here the top leader supports any program he feels appropriate, and then the program can be implemented.

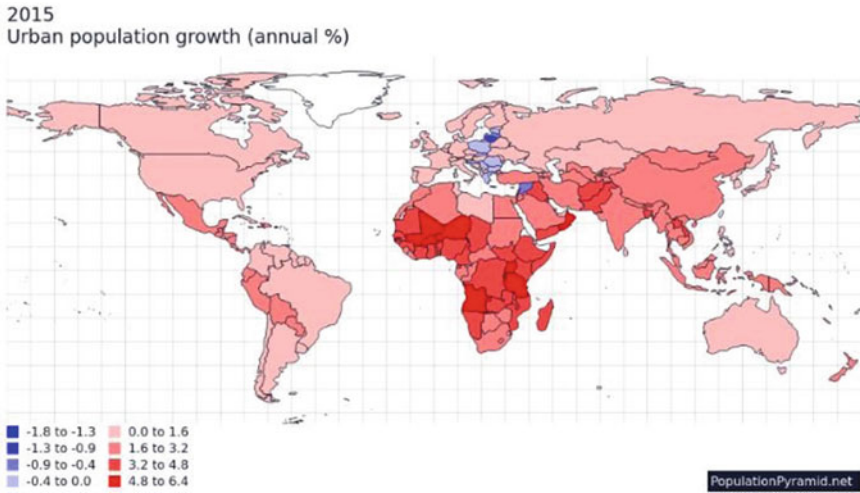


Fig. 13 Annual Urban Population Growth (%) 2015. Source [8]

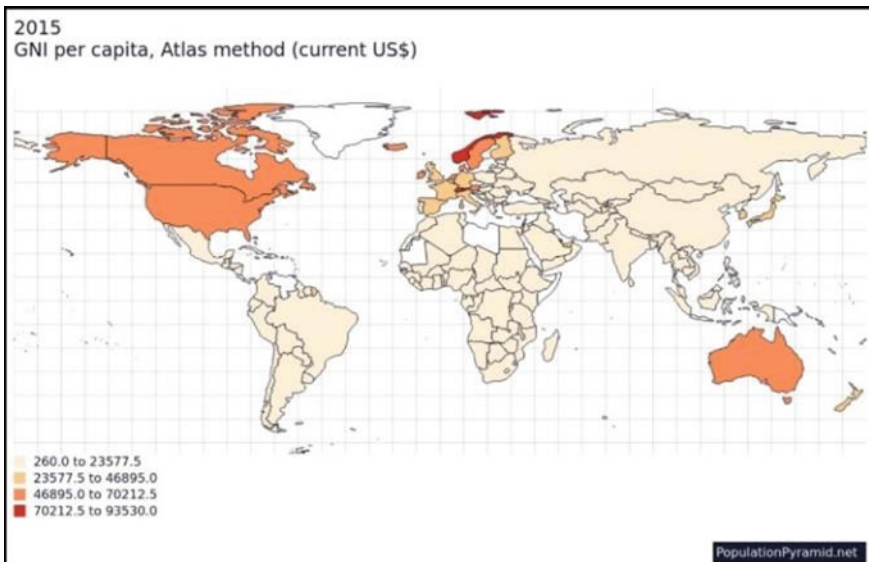


Fig. 14 GNI Per capita 2015. Source [8]

In democracies, there are periodically elected legislators to frame policies and administrative rules for issues such as, say, disaster management enacted in parliaments and assemblies and regulators and organizational mechanisms to implement the regulations, and the judiciary to see legislations and rules according to the principles laid down in the constitution, and finance commissions at national and state

level which allocate various taxes collected for a rule-based system of governance as above. Although there is a provision to mobilize funds for implementation outside the tax revenues, the administrator’s legislative leadership with a low level of expertise in entrepreneurship fails to do so, and such income for governing bodies tends to be near zero.

A case study of India is presented to explain two essential components of the program region legislative, administrative bodies, and finance commission, and how it functions in a democracy. A simplified presentation is attempted below without considering the modifications in the Union Territories of India, such as Delhi. The diagram below represents the area-wise-constitutionally constituted elected bodies and administrative machinery with a periodic election and permanent organizational structure tasked to execute the rules and regulations laid out above in parliament and legislative assemblies (Fig. 15).

The above diagram represents the general structure, but it can vary since state governments can adopt or modify the overhead system given in the way they want as per the constitution. Further delineation of these areas is democratically done at the state and union level.

The multi-level planning, administrative, taxing, and tax revenue sharing system is tabulated below. There has been some modification recently with the central Planning Commission, which abolishes the Five-year Plan. India followed socialism with a mixed economy from 1947 to 1991, fully supporting, weighing, and depending heavily on state-owned enterprises like any communist country until 1991, when India faced near bankruptcy changed the course from socialism to Capitalism with

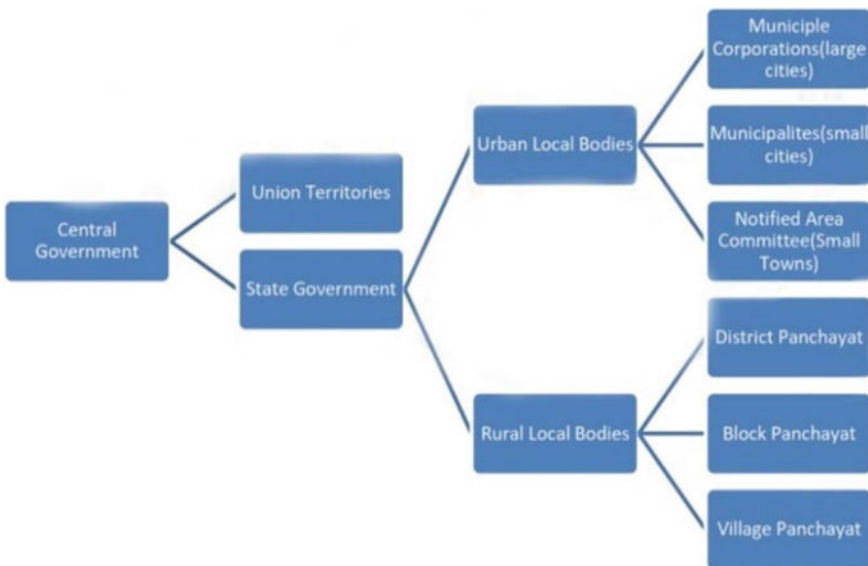


Fig. 15 Legislative and administrative structure of India. Source Author

disinvestment programs of public sector enterprises, such as Air India. Then it moved to a capitalist economy where private entrepreneurship is accepted, and state-owned enterprises are not. The above diagram and table below National Five-year Plan do not exist. However, some states with the Communist Party still ruling worship state planning board and the five years plan the state planning board in the respective state makes, following the yesteryears communist country protocol for public investment. At the same time, the Chinese Communist Party follows capitalism, and the Russian Communist Party, except for Cuba and Venezuela, is in poverty (Table 2).

The multi-level governing system is tabulated below.

The Finance Commission of India is a constitutional body that has survived for over 50 years in India. Formed under Article 280 of the Indian Constitution, the Finance Commission of India functions as a quasi-judicial body. The purpose behind the formation of this Commission is to determine the methods and formulas necessary for distributing the tax proceeds between the Centre and states as well as among the states as per the arrangement provided by the Constitution of India and current requirements. Along with this, the taxes and grants that are to be provided to the local bodies in states for their functioning are also determined by the Finance Commission of India.

Table 2 Multilevel political, administrative, and taxing and sharing of the tax system of India

Planning level	Political/ Administrative level	Planning approach	Power to Tax	Share of Tax
National not existing in India	Union Government	Central Policy Sectoral Policies and Plans	Yes	Yes
Federal	State Government	State Policy Sectoral/ Regional/River Valley/ Hill area planning	Yes	Yes
Sub Federal 1	District Panchayat /Metropolitan/ Administration/ /Committee	Metropolitan /District/Planning/ Budgeting	Yes	Yes
Sub Federal 2	Block Panchayat/ Administration/ Urban Zones	Block/Zonal/Planning/ Budgeting	No	Yes
Sub Federal 3	City/Gram Panchayat/Ward Committee/ Village	Annual Planning/ Budgeting	No	Yes
Sub Federal 4	Community/ Resident Welfare Association	No	No	No

Source Author

Article 281 of the Constitution provides that the President of India is required to lay the Finance Commission report before each House of Parliament along with a note that explains the actions taken by the government based on the recommendations the Commission gave. It was the 73rd Constitutional Amendment Act, 1992 that facilitated the constitution of a Finance Commission at a 5-year interval by the state governments to decide the division of resources between the state government and the Panchayat institutions at all levels.

The functions of the Finance Commission are;

1. It is the responsibility of the Finance Commission to recommend the distribution of the net proceeds of taxes that are supposed to be shared between the Union, and the states, along with the inter-state distribution.
2. The Finance Commission recommends the principles that are applied to govern the grants-in-aid to the states and the Union Territories by the Union from the Consolidated Fund of India.
3. The Commission recommends the measures that need to be adopted to augment the consolidated fund of a state to facilitate supplying the required resources to the panchayats and the local bodies of the state to avoid hindrance in their functioning. The Commission must carry out this function based on the recommendations made by the state finance commissions as per their requirement.
4. As it is the President of India who carries out all the necessary formalities with the Finance Commission of India, any matter which the President feels needs to be considered by the Finance Commission from time to time will be taken up by the Commission as a function only. The Commission submits a report to the President after delivering the necessary parts allotted to it. The President presents this report before the Houses of Parliament and accompanies a memorandum explaining the Commission's essential actions to fulfill its functions.

Given the above multi-level planning, administrative, and financing structure of one democracy, India in the Indo-Pacific, it is necessary to investigate how the Indo-Pacific programs can function. We must understand the concept of the Indo-Pacific sector scheme or program.

For example, suppose a community sub-Federal 4-level entity can independently plan, finance, and implement a project or program for the community with no outside help. In that case, it is called the Community Sector scheme.

Suppose a watershed management program cutting across two adjacent villages must be taken up in a community development block. In that case, it becomes the next level sector scheme, precisely the sub-Federal 3-level gram panchayat/ward committee level. This is called a gram panchayat/ward committee sector scheme or program.

In the case of Indo-Pacific, we all know that only a few countries have vaccine technology for COVID-19. Further, many countries have no manufacturing facility for vaccines, and the vaccine-specific cold-chain infrastructure and logistics are not available for many countries. Vaccine availability is limited, and rich countries have more access than poor, low-income countries; foreign exchange for vaccine procurement is not open, and then it becomes a QUAD Sector project or Indo-Pacific Sector

program since the US, Japan, Australia, and India can jointly execute all in collaboration with National Governments. They have patents, technology, manufacturing facility, logistics and cold-chain expertise, and finance capabilities. The only limitation is that QUAD has no Governing status like the European Union, which can be overlooked. This is more of an advantage than a limitation.

Given this limitation, how can QUAD execute all its regional programs? There are two possibilities. The mistakes made by the Union Government of India can be repeated with less.

Application of mind by propagating it as a program outside the Governing structure and functioning. JNNURM, an urban development program, had a City Development Plan as the basis of implementation, bypassing the legal Master and Zonal Plans. This weakened the existing lawful provision on Urban Development and Regulations. Again, in the one hundred smart city programs of the Union Government, they had a particular purpose vehicle that effectively bypassed the local self-government of the Municipal Corporation in the Indian Constitution of an ignorant bureaucracy and poor level of the knowledge base of an elected politician. This weakened the Municipal Corporation and did not allow them to experience urban development projects, which is their constitutional right.

First, divide all QUAD programs or projects into welfare or economic development projects. Make this welfare program an external collaborative project or program using all types of machinery, both legislative, technical, and administrative, available following all existing protocols strictly based on cost-effective efficiency.

Since most of the democracies in the Indo-Pacific follow a capitalist economy where the private sector conducts industry and services, QUAD, through the diplomatic channel, can enable such collaboration.

In addition to collaborating with start-ups for the advanced technology-based economic development of QUAD, they can also collaborate with levels and institutions marked “No” in the above table if it is a community-based program.

1.3.3 Indo-Pacific Polarized Region

The Indo-Pacific is a polarized region. This region is the creation of the QUAD, the US, Japan, Australia, and India. The QUAD advocates for a multipolar world in Indo-Pacific since it is too big for a unipolar world. When we consider the multipolar world, we see countries here as units of discussion and not villages, towns, or people.

People matter, and for Indo-Pacific smart people matter more for economic and social development. Intelligent people have their habitats, villages, and towns. They can form a spatial community for converting their work and living into a smart community habitat that creates an innovative community economy. They can form a community of like-minded professionals, such as a community of chartered accountants, and a non-spatial community in cyberspace to extend professional services such as filing income tax returns and all other accounting services of other distant countries using broadband internet.

The following data presentation speaks about the ability of Indo-Pacific into the path of the digital economy much faster than the other parts of the world based on the statistics given below on broadband usage (Fig. 16 and Table 3).

Generating a large pool of intelligent people in the Indo-Pacific is required for an innovative community. It means creating a competent, professional class with expertise in Science, Technology, Engineering, Mathematics (STEM), and entrepreneurship through an enlightened educational policy. India has a brand new National

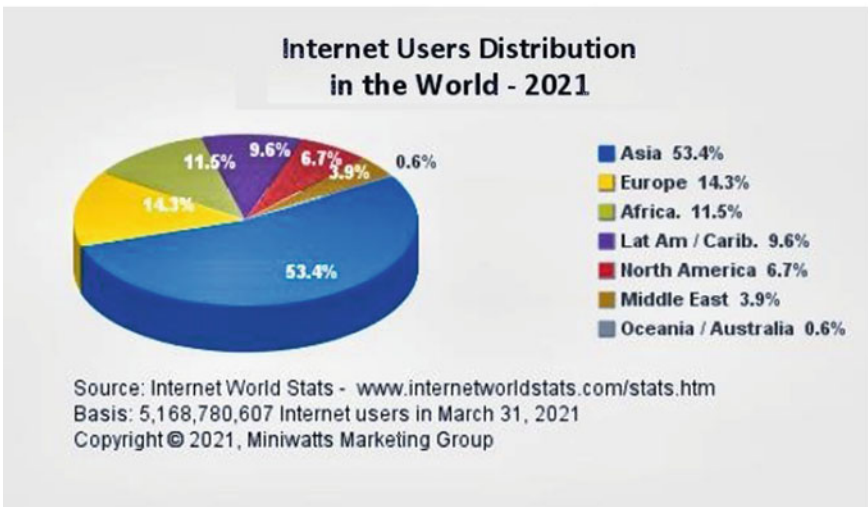
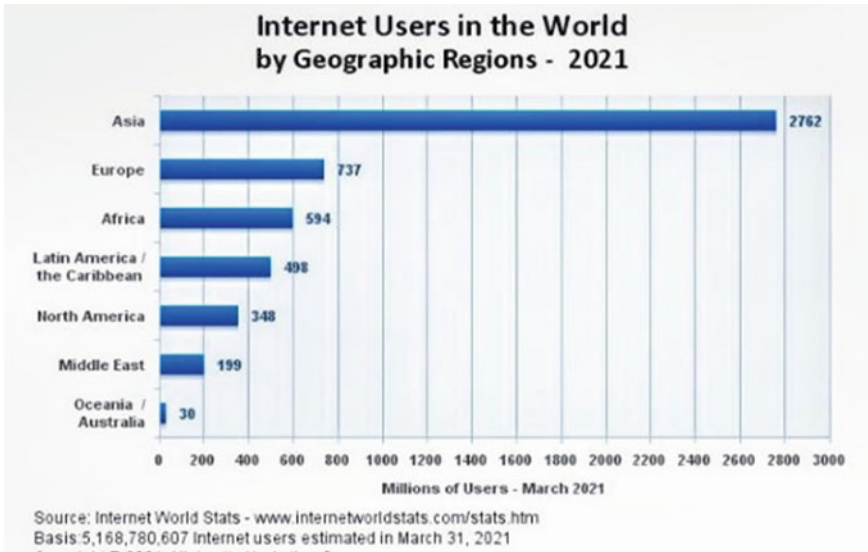


Fig. 16 Internet usage

Table 3 World internet usages by population statistics 2021 Year Q1 Estimate

World region's	Population estimate 2001	Population % of World	Internet users March 31, 2021	Penetration rate *% pop	Growth 2000 to 2021	Internet World %
Asia	4,327,333,821	54.9	2,762,187,516	63.8	2316.5	53.5
Europe	835,817,920	10.6	736,995,638	88.2	601.3	14.3
Africa	1,373,486,514	17.4	594,008,009	43.2	13.058	11.5
Latin America/ Caribbean	659,743,522	8.4	498,437,116	75.6	2658.5	9.6
North America	370,322,393	4.7	347,916,627	93.9	221.9	6.7
Middle East	265,587,661	3.4	198,850,130	74.9	5953.6	3.9
Oceania/ Australia	43,473,756	0.6	30,385,571	69.9	298.7	0.6
World Total	7,875,765,587	100	5,168,780,607	65.6	1331.9	100

Note Population-based on UN Population Division, Internet data published by Nielson Online by the International Telecommunication Union (www.internetworldstats.com)

Educational Policy, and other countries in the Indo-Pacific need to review their policy. This professional education is long-drawn and at present costly for many people. A free university education, recommended earlier in the chapter, ensures the sustained supply of smart people to the Indo-Pacific. Not all graduates can be the generator of Unicorns, a one-billion-dollar industry that is a tiny part of the university.

Graduate population. This tiny population grows in numbers and can only be available if there is a large pool of STEM graduates in the Indo-Pacific. Free education removes the burden of the debt-ridden university-educated population, which the West has presented as the capitalist model of university education. Free education makes the STEM graduate happier to live without debts, improving their quality of living and income since only a reasonably high quality of living brings about more Unicorns. The university shall be greenfield, freshly designed, or brownfield retrofitted and unbundled to make the marginal cost of education near zero to be sustainable. This calls for international collaborative research to study countries' experiences with free or partially free education and formulate a generalized design that all regional universities can adopt. However, there are limitations in several countries in the Indo-Pacific where the demographic future is not promising, with the share of the working population decreasing. The aged and non-working population is disproportionately increasing, resulting in the depopulation of megacities like Tokyo and soon many megacities in the People's Republic of China unless there are enlightened migration policies that remedy the situation, such as in the USA. This book recommends open and enlightened migration policies which need to be studied

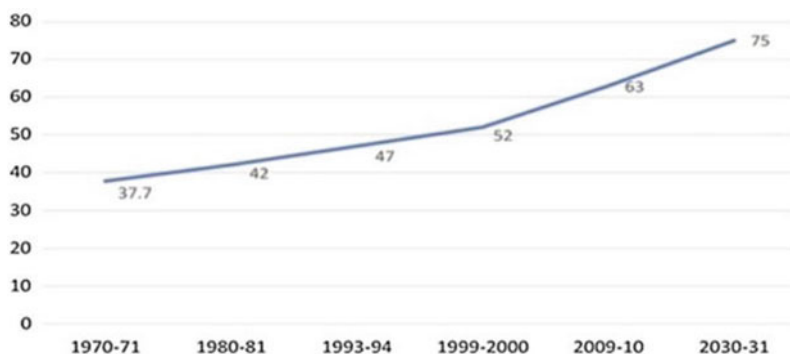


Fig. 19 Urban Share of GDP in India 1970–71 to 2030–31. *Source* [9]

Table 4 Trends in India's Urbanization 1961–2011

Census year	Urban population (in million)	Proportion urban	Annual exponential growth rate (%)
1961	78.64	17.97	–
1971	209.11	19.91	3.23
1981	159.46	23.34	3.79
1991	217.18	25.72	3.09
2001	286.12	27.86	2.75
2011	377.10	31.16	2.76

Source Government of India (2011) Census of India 2011, Provisional Population Total, Urban Agglomeration and Cities, New Delhi

The economic relationship between urban and rural areas sustains the functional region through sustainable, healthy, and robust economic linkages.

This book advocates a model of the System of Indo-Pacific Megacities for Indo-Pacific. To sustain and prosper a megacity of more than ten million population, it requires a well-established functional region comprising a system of villages, towns, and other neighboring countries that sustain it by supplying the megacities with all goods and services to survive daily. In addition, these megacities also cater to the economic activities of the adjoined countries by providing physical and institutional gateway infrastructure such as harbors, sea and dry ports and airports, and related institutions and services. Imagine wrong monetary policies cutting off this functional region in Sri Lanka or Pakistan. Then there will not be long-range survival of the megacity. Imagine a prolonged war like in Ukraine with no diplomatic dialogue to end the war; then, the megacity is destroyed physically and economically.

The megacity system model simplifies the complex reality of innumerable villages, cities, metropolises, and megacities in some countries of the Indo-Pacific and gives an operational framework for all programs in the Indo-Pacific. Megacities are smart and global, with robust functional linkages as an operating region.

So, suppose one initiates any Indo-Pacific program in megacities with the intention of its spread in the immediate subregion use. In that case, it can spread fast with existing linkages, and there is no need to work directly in the villages and towns. This reality can be empirically verified by the daily movement of people and goods from megacities and the flow of communications and money among the megacities of the Indo-Pacific.

The worst thing one can do on a map of a city or region is to draw its boundary around a city or area as if a wall exists around it. This conceptually has limited the growth of the international megacity system. Statistically, the census of India considers a metropolitan area as a contiguous spatial area with urban characteristics of one million population or more within a district, even if it spreads beyond the district as if there is a wall. Again, suppose many districts have a spatially interconnected metropolitan urban area, like five districts from Kannur to Kochi. In that case, it is a megacity when it crosses a population of ten million. Still, the census of India considers it as five metropolitan areas and not a megacity, an excellent example of statistical forces or enemies against megacity numbers in India.

Institutionally, there is a Metropolitan Area Committee for legislative and administrative purposes. Still, no megacity institutional setup appropriate exists in India, although the biggest meta city in the world surpasses Tokyo Delhi in the making soon.

The model we put forward for the megacity system of Indo-Pacific system of cities consists of all megacities within the region and the serving subregions of the megacities and the adjoining countries which makes use of the megacity for its gateway to the Indo-Pacific Ocean. Here the Author considers the adjacent landlocked country as a part of the megacity family, like Bhutan and Nepal as part of the family of Kolkata megacity.

Our previous works have established that all megacities are innovative and global. In this book, Author states that megacities are functionally interconnected as a system of 21 megacities in the Indo-Pacific. This interconnection is already manifested by the daily movement of goods, services, money, and communications between these megacities. Global politics determines the change of intensity of comprehensive interactions between megacities and related supply chain movements and affects the international economics of people who do not love peace. The imminent wars India faces with China and amassing of soldiers on the country border create economic barriers for megacity functional economic relationships for security reasons with the neighboring country, which affect them considerably, for example, India and China today and European Union and Russia. India is now open to all countries in the world to participate in the 5G introduction barring China for security reasons, and so also the Belt and Road Initiative is locked in India based on sovereignty issues, and Foreign Direct Investment from China is very limited or collaboration with them by Indian industry and commercial establishment. Chinese industries and commercial firms in India are scrutinized very minutely by intelligence agencies of India for Indian security breaches consequent to the determinant of Chinese commercial and industrial activities in India, and evidence of their shrinking is manifested by

Chinese firms in Indian megacities nowadays. So, China's commercial relationship will decline with India in the future, and the megacity system that connects India with China gets reduced or even broken. In the coming years, with India and no Industries from China can be established in India in comparison with other countries, and goods and services from China will be highly restricted with the policy that China can like policies such as selling only smartphones for less than Rs 12,000 in India. The development of ICT, IoT, M2M, and Industry 4 used in smart cities extensively opens all possibilities for the integrated creation of products and services in multi-countries in multi-megacities and subregion in a seamless fashion barring China through the megacity system of Indo-Pacific.

Such products and services constitute the supply chains that sustain the needs of the megacities and their hinterlands and adjoint serviced countries in the most resilient manner. Megacity resilience has three sets of factors global politics, the resulting Global Economics, and social, cultural, and ecological resilience.

The smart global megacity system operated by smart people is highly responsive to likely changes in supply chains in the market economy. It acts with less ideological hesitation to overcome shortages such as food and energy and possible economic downturns due to gradual movement from a frozen state to a deep frieze storage state, such as economic relationships with India and China. Smart people acts by replacing the supply chains with feasible and cost-effective means to overcome this in which part of the megacity system within China is in a deep freeze stage for other megacities while others are active. China has a problem of a shortage of working-age groups in the coming decades, as indicated in the figure on the age pyramid projection given above, which may result in a gradual reduction of population in their megacities as experienced by Japanese megacities and even South Korea from their demographic and migration profiles. This can be remedied by immigration, but China is not a famous immigration country for many countries, even if policy changes occur in China, unlike the United States. This phenomenon narrated above was evident after sanctions due to the Ukraine's war for food and energy commodities was felt in distant Africa, South Asia, and Europe. This became near normal with certain countries affected by the recession and others not based on ideology superimposed over them but by smart people who know how to act.

1.3.4 Countries in Indo-Pacific

Thirty-six nations are 50% of the world's population, 3,000 different languages, several of the world's largest militaries, and five nations allied with the US through mutual defense treaties that are part of the Indo-Pacific. Australia, Bangladesh, Bhutan, Brunei, Cambodia, Fiji, India, Indonesia, Japan, Laos, Malaysia, Maldives, Myanmar, Nepal, New Zealand, Papua New Guinea, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Timor-Leste, United States, and Vietnam. They are divided into the following.

Central Indo-Pacific

The Central Indo-Pacific includes the numerous seas and straits connecting the Indian and Pacific oceans, including the waters surrounding the Indonesian archipelago except for Sumatra's northwest coast, which is part of the Western Indo-Pacific, the South China Sea, the Philippine Sea, the north coast of Australia, and the seas surrounding New Guinea, western and central Micronesia, New Caledonia, the Solomon Islands, Vanuatu, Fiji, and Tonga. The Central Indo-Pacific, due in part to its central location at the meeting of two oceans, has the most incredible diversity of corals and mangroves.

Eastern Indo-Pacific

The Eastern Indo-Pacific surrounds the mostly volcanic islands of the central Pacific Ocean, extending from the Marshall Islands through central and southeastern Polynesia to Easter Island and Hawaii.

Western Indo-Pacific

The Western Indo-Pacific covers the western and middle portion of the Indian Ocean, including Africa's east coast, the Red Sea, the Gulf of Aden, the Persian Gulf, the Arabian Sea, the Bay of Bengal, and the Andaman Sea, as well as the coastal waters surrounding Madagascar, Seychelles, Comoros, Mascarene Islands, Maldives, and the Chagos Archipelago.

2 Megacity System

The megacity system is highly complex spatially and very expensive for systematic governance, as practiced by existing structured government administration. Still, systemically much more accessible, this social ecology is very natural for all person-to-person or community-to-community or institution-to-institution value-added economic interactions transcending country boundaries in the Indo-Pacific if administrators do not interfere "legitimately" for doubting corruption or valid reasons in the name of Governance. This can be replaced for mutual benefit by platform governance as practiced by the Indian Income Tax Department of the Government of India or GST using AI and blockchain technology to replace corruption possibilities footprint of governance and all participants. Platform governance will create job opportunities for start-ups and STEM graduates. The unemployed waiting to migrate to other countries are available in many countries in this region.

Understanding it and deciphering how countries can benefit from the Indo-Pacific megacity system requires modeling. Modeling is a simplification of the reality of the Indo-Pacific megacity system.

Based on the reality of the Indo-Pacific, this region is conceived as the first megacity system transcending countries physically well interconnected by internet, sea, air, and railway and road connection. Megacities are part of different countries, having dissimilar central, federal, and local self-governance systems. The immense

amount of money flows in a limited geographic space of megacity for daily expenditure and income of households, commercial establishments, industrial, service sector institutions, and other sectors of the economy ensures lasting sustenance. An approach of a self-generating megacity economic system developed in cooperation with other megacities based on experience is the only way for accelerated development out of the experience.

These households and institutions, both the government and private sector, have immense potential to interact economically and politically with the system of megacities. The countries where these megacities are located are mostly not bound by any treaty of any one country to another, but few are. They have immense opportunity to work together without a formal international governance system of the Indo-Pacific system like the European Community.

While international laws, court judgments, and intercountry treaties are being broken, like in the case of the Philippines and China border disputes, international bodies have no further action for global peace. There is a weakening of international bodies like WHO in the COVID-19 pandemic, which is unable to find out the origin of COVID-19 and intervene scientifically based on facts emerging in the source of the Pandemic and ineffective in wars such as in Ukraine. Increasingly these bodies' effort is effectively complemented or even replaced by mainly by intercountry institutions such as NATO, G20, BRICS, SCO, or individual countries.

These intercountry collaborative activities further strengthen the Indo-Pacific, although countries can cooperate or reject the cooperation even for disaster relief or free COVID-19 vaccination.

There is unlikely to be a similar European Union Governing structure in the Indo-Pacific.

2.1 The Regional Megacity System of the Indo-Pacific.

The megacity system of the Indo-Pacific is part of the international. Furthermore, regional human settlement systems open to mutually beneficial economic outcomes through economic interactions such as joint production as part of the supply chain, a rich market, and a provider of superior services which only megacities can provide to other megacities and their subregions. This collaboration can happen in the multi-megacity, between governments and private sectors, government to government, from individual to individual, community to community, or institution to an institution if the country in question is willing to collaborate and prosper with another megacity in the megacity system of Indo-Pacific with governments support without corruption. This collaboration of human settlement is creating its influence felt on the subregion of each megacity and system of megacities forming a powerful engine of economic growth and development in the Indo-Pacific region unknown until Indo-Pacific. A deliberate push and initiative are required from the participants here. It can never evolve as a part of incremental regional economic development due to the allocation

of tax revenues discussed above. These initiatives can be classified as national and international. The nation's bureaucrats administer the policies, programs, and tax allocation.

Revenues within the Nation. Outside the nation, it is the diplomats of the countries in the Indo-Pacific who facilitate innumerable groups in their own countries and abroad to collaborate with foreign megacities, which include businesses, institutions, universities, international agencies, and countries in the Indo-Pacific. The subregion of the megacity with a lower-level urban settlement system also benefits from this economic development. Many landlocked countries depend on the megacity in other countries for their gateway functions for international financial activities. These countries are the international part of the megacity sub-system. For example, Kolkata has its subregion for economic activity in Eastern India. It is servicing landlocked countries such as Bhutan, Nepal, and others and other megacities in the Indo-Pacific region, such as Bangkok, Dhakka, and Jakarta. Furthermore, a few countries can interact with Kolkata because of the adjacency of Thailand, Bangladesh, Indonesia, Myanmar, and other SARC countries and a few ASEAN countries to Kolkata.

2.2 *The Indo-Pacific Region*

The Indo-Pacific region is shown below in Fig. 1. This covers a substantial area of earth and sea. At the same time, the western part of the USA faces Russia and China, the Indian Ocean envelopes East Africa, ASEAN countries, and Australia and New Zealand, as shown in the map below (Fig. 20).

While the allies may follow the leadership of the US, other collaborators of the Indo-Pacific may disagree with the narrative of the US allies and the US, for example, the war in Ukraine and as shown in the G 20 countries' finance ministers meeting in 2022 in which Russian speech was boycotted by only 10 out of 20 of the US allies and voting in the United Nations assembly and security council's took place in 2022. This is an expression of a robust multipolar Indo-Pacific which articulates independent foreign policies that fully account for countries' self-interest and long historical relationships and **does only agree** with United Nations sanctions and not any one individual country or a grouping of countries such as NATO country sanctions. Whether sanctions help the cause of the sanction and the results intended is debatable.

With the rising involvement of the US, UK, France, and the Netherlands in the new growth areas of Indo-Pacific, the idea of the Indo-Pacific Economic Corridor was conceptualized during the US-India Strategic Dialogue of 2013, when Secretary of State John Kerry referred to the potential of the Indo-Pacific Economic Corridor, in transforming the prospects for development and investments as well as for trade and transit between the economies of South and Southeast Asia Indo-Pacific economic corridor [3].

K. Y. Home, in his scholarly study, has mapped out the potential for various emerging trans-regional corridors in Asia along with the challenges of linking IPEC

into the more extensive web of regional economic integration initiatives taking shape in the region in 2017 [4].

The following summarizes significant countries in the Indo-Pacific (Table 5).

Table 5 Major countries of Indo-Pacific region population and GDP

S No	Country	Land Area (sq. km)	Population 2017	GDP Million US\$ (2017) GDP per Capita US\$ 2017	GDP per capita US\$ 2017	Capital
1	Australia	7,692,024	23,731,000	1,482,539	49,928	Canberra
2	Bangladesh	147,570	156,594,962	205,715	1359	Dhaka
3	Bhutan	38,394	742,737	6384	2804	Thimphu
4	Brunei	5765	415,717	17,426	26,939	Bandar Ser Begawan
5	Cambodia	181,035	13,205,539	16,899	1270	Phnom Penh
6	Fiji	18,274	909,389	8330	5153	Suva
7	India	3,287,263	1,324,171,354	1,690,000	1939	New Delhi
8	Indonesia	1,904,569	252,164,800	856,066	3570	Jakarta
9	Japan	377,944	126,434,969	4,769,804	38,884	Tokyo
10	Laos	236,800	6,320,000	11,707	2353	Vientiane
11	Malaysia	329,847	30,185,787	336,913	9503	Kuala Lumpur
12	Maldives	298	341,356	4920	8602	Male
13	Myanmar	676,578	50,496,000	65,291	1275	Naypyidaw
14	Nepal	147,181	26,494,503	62,384	730	Kathmandu
15	New Zealand	268,021	4,357,437	201,028	39,427	Wellington
16	Papua New Guinea	462,840	6,732,000	16,096	2183	Port Moresby
17	Philippines	343,448	107,242,000	289,686	2951	Manila
18	Singapore	710	5,183,700	307,085	52,961	Singapore
19	Sri Lanka	65,610	20,277,597	233,637	3835	Colombo
20	Taiwan	36,191	23,119,772	505,452	31,900	Taipei
21	Thailand	513,120	67,764,000	380,491	5908	Bangkok
	Timor-Leste					
22	United States	983,520	328,271,859	19,386,800	59,531	Washington
23	Vietnam	331,210	88,069,000	187,848	2186	Hanoi

Source [10]

2.3 *Geopolitical Context of Indo-Pacific*

In 2019, the US State Department published a document formalizing the concept of a “Free and Open Indo-Pacific,” to be sustained among members of “the QUAD,” a partnership of four Indo-Pacific democracies led by the United States, in concert with Japan, Australia, and India [11], and Japan.

As stated earlier, ‘Indo-Pacific’ has also featured prominently in top-level US strategic documents such as the 2017 National Security Strategy [12], the 2018 Nuclear Posture Review, and the 2018 National Defense Strategy [13]. It has been argued that the concept of the Indo-Pacific may lead to a change in popular “mental maps” of how the world is understood in strategic terms. In 2013, US officials began.

It was using the term “Indo-Asia Pacific.” This enabled America to maintain its geographic inclusiveness in the new Indo-Pacific coinage.

The term’s profile was mentioned in the joint statement issued by Indian Prime Minister Narendra Modi and US President Donald Trump after the former’s state visit to the White House on June 26, 2017. “As responsible stewards in the Indo-Pacific region, President Trump and Prime Minister Modi agreed that a close partnership between the United States and India is central to peace and stability. In marking 70 years of diplomatic relations between India and the United States, the leaders resolved to expand and deepen the strategic partnership between the countries and advance common objectives. These objectives include combatting terrorist threats, promoting stability across the Indo-Pacific region, increasing free and fair trade, and strengthening energy linkages.” However, President Trump’s November 2017 articulation on Indo-Pacific was widely seen as something that would usher in a new (US-China) Cold War. This led to the Indian Prime Minister spelling out the Indian vision of Indo-Pacific as an enabler for “a common pursuit of progress and prosperity... not directed against any country. (Albeit based on) our moral commitment to the rule of law.”

The Pacific Ocean is vast, covering North and South America, but the Indo-Pacific is confined to the west coast of the USA and not South America. The exclusion of South American megacities is due to the gravitational pull of the population concentration of India and China as well as the attention of the megacities in the North than in the south of the Pacific Ocean and the south-east the ASEAN countries linking to the north of Pacific. It is possible to have a like UAE, the USA, Israel, and India QUAD2 as QUAD 3 to South America connecting and opening to the US and India if there is a national will. The export of such economic activities from developing countries to developed countries is likely to narrow down to a city with megacities with a better endowment of production and marketing factors. The research’s subject is the landmass, governments, and megacities interconnected to the Indo-Pacific. This region also accounts for numerous island countries, as stated earlier. Some islands are as big as Java, but others are very tiny. The megacities system needs to service these island communities for rapid economic development.

3 Urbanization, Economic Development, the Growth of Megacities in the Indo-Pacific

The world population is progressing toward more of the urban than the rural economy. While in 2005, urban and rural people were equal in percentage, as shown in the figure below, ever since the urban population surpassed the rural. Although Africa lags behind Asia in urbanization, the Indo-Pacific is less urban than Europe but more urban than Africa, as stated in the table below on the share of the urban population in the world for major regions.

The share of the urban population in the world for major regions is shown in the table below (Table 6).

Among the countries in the Indo-Pacific, the growth of the working population is an essential indication of sustaining economic growth. If the worker population is inadequate, a need is there to attract more workers, and the government must have a highly welcoming immigration policy or promote economic development in other countries where these endowments are high. The graph below shows the growth of the working population in different countries. It is almost flat for South Korea and the US. It is declining in China and increasing in India (Fig. 21).

With increasing urbanization, there has been a shift in the pattern of the economy. These shifts and economic changes may vary from country to country as urbanization progresses. The time series change in India is as shown (Tables 7 and 8).

It is essential to consider the changes in demography, especially the working-age group, immigration patterns, and trends of a shift in the economy and develop

Table 6 Urban population (in million) and its proportion to the total population by major regions, 1950–2050

Major region	1950	1975	2000	2025	2050
Africa	32 <i>14.0</i>	103 <i>24.7</i>	279 <i>34.5</i>	659 <i>44.9</i>	1339 <i>55.9</i>
Asia	245 <i>17.5</i>	597 <i>25.0</i>	1,393 <i>37.5</i>	2,561 <i>53.9</i>	3313 <i>64.2</i>
Europe	283 <i>51.5</i>	443 <i>65.4</i>	517 <i>70.9</i>	562 <i>75.8</i>	581 <i>82.0</i>
Latin America and the Caribbean	69 <i>41.3</i>	197 <i>60.7</i>	396 <i>75.3</i>	567 <i>82.1</i>	674 <i>86.2</i>
North America	110 <i>63.9</i>	179 <i>73.8</i>	249 <i>79.1</i>	325 <i>83.4</i>	390 <i>87.4</i>
Oceania	8 <i>62.4</i>	15 <i>71.9</i>	22 <i>70.5</i>	32 <i>71.1</i>	42 <i>73.5</i>
World	764 <i>29.6</i>	1,535 <i>37.7</i>	2,856 <i>46.6</i>	4,706 <i>58.2</i>	6,339 <i>66.4</i>

Note Urban population is shown in millions. Proportion (%) is shown in *italics* Source United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision, CD-ROM Edition

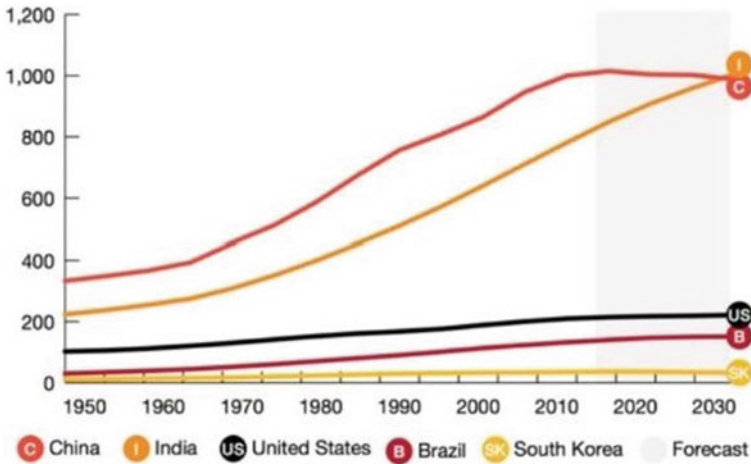


Fig. 21 Growth of working-age population of countries 1950 to 2030. Source PwC: [14]

scenarios for regional development. One such alternate design is presented below for India.

With increased urbanization, cities generate higher GDP than rural areas. The bigger the city size, the more the share of GDP. For example, the megacity Dhaka accounts for a sixty percent share of the GDP of Bangladesh, while the Indian megacities’ percentage is not skewed to anyone’s megacity. A megacity economy drives Bangladesh’s economic and social indicators far ahead of India’s.

The following four maps show the Growth rate of Urban Agglomerations by size class and percent urban and rural in 1979, 1999, 2018, and 2030.

From 1990 to 2018, many metropolises and megacities started growing in the Indo-Pacific, and this is projected to accelerate from 2018 to 2030. This shows a more significant shift in increased GDP growth in the Indo-Pacific in the coming decades.

It can also be seen that there is no appreciable change in the settlement pattern in Europe, while the USA shows some marginal growth in large cities (Figs. 22 and 23).

Megacity in a democracy with a market economy means people, and they are intelligent people primarily who smartly drive the international economy, foreseeing all possibilities. The institutions and infrastructure in megacities are intended to create smart people required for following the above strategy. These are available in the world’s megacities and not in small cities or villages.

The figure showed the Projected World Population Distribution by the size of settlements in 2016: it can be seen that the share of the population living in megacities is only 8.2% and other lesser measures, as shown in the figure.

The time series growth of the world’s megacities is presented in the table below.

The growth of megacities in the world is shown below for the following benchmark years 1950, 1975, 2000, 2005, and 2015 (Table 9).

Table 7 Size of national domestic product (NDP) by sectors and per capita NDP in India

Year	Urban NDP as % of total	Value at the current price (Rs in a million)				Value at (1999–2003 thousand price) (In Rs)					
		Value at the current price (Rs in a million)		(In Rs)		Value at (1999–2003 thousand price) (Rs in a million)		(In Rs)			
		Agric culture e	Indus try	Service	Tota l GDP	Per capita GDP	Agriculture	Industry	Service	Total NDP	
1970–71	37.65	6.5 (4.7)	51.74 (37.4)	80.26 (57.9)	138.5 (100)	1294	74.34 (4.9)	594.2 (39.4)	839.8 (55.7)	1508.3 (100)	14,142
1980–81	41.09	22.5 (5.0)	170.9 (37.7)	259.9 (57.3)	453.4 (100)	2888	114.8 (5.4)	801 (37.4)	1225.7 (57.2)	2141.6 (100)	13,951
1993–94	45.73	139.4(4.4)	1046.9 (32.8)	2005.7 (62.8)	3192 (100)	13,525	222.4 (4.6)	1583.9 (32.5)	3069.7 (63.0)	4875.9 (100)	20,997
1999–00	51.7	291.4 (3.5)	2097.9 (25.3)	5911.1 (71.2)	8300.4 (100)	30,183	291.4 (3.5)	2097.9 (25.3)	5911 (71.2)	8300.4 (100)	30,183
2004–05	52.02	308.7 (2.2)	3649.7 (26.5)	9808.2 (71.2)	13,766.5 (100)	44,223	279.7 (2.4)	2942.1 (25.6)	8258.3 (71.9)	11,480 (100)	37,245

Note Figures in the parentheses are shares in percent
Source National Accounts Statistics (various years)

Table 8 Three economic growth scenarios for India, 2014–2034

Scenario one	Scenario two	Scenario three
<i>Pushing old ways faster</i> outlines a focus on investment in education, health, and other dimensions related to human capital. Our analysis suggests that in this scenario, India's GDP could see a 6.6% compound annual growth rate (CAGR) between now and 2034	<i>Turbocharging investment</i> outlines the impact of rapid and significant investment in physical infrastructure and envisions a 7 trillion GDP leading up to 2034	<i>The Winning Leap</i> includes investment in human and physical capital (as in the previous two scenarios) but also focuses on investment in R&D and innovation and envisions a 9.0% CAGR for GDP between now and 2034. This scenario forecasts the most aggressive growth and is the only scenario that will generate 240 million new jobs India's growing population needs over the next 20 years

Source [15]

In 1950, there were only two megacities Tokyo in the Indo-Pacific and New York outside. It became 3 in 1975, including Mexico and New York outside the Indo-Pacific. In 2005, fifteen megacities were added, and then in 2015, another nineteen megacities were added, which shows a rapid addition rate of megacities. Most of these came up in the Indo-Pacific, as shown in the (Table 10).

Megacities distribution among continents is as shown in the map below. Here one can see that it is more in the Indo-Pacific in the eastern part than in the west or south (Figs. 24 and 25).

The population growth rate megacities are shown with Lagos leading and Osaka and Tokyo showing harmful growths. Again, the left half of the high-growth megacities are from the Indo-Pacific.

The Indo-Pacific's megacity system research focuses on discovering emerging architecture. It has an issue-based sectoral dimension and a city-based system of city-based megacity dimensions, the subject matter of many chapters in the two parts. This Indo-Pacific in recent decades has shown rapid economic development in several countries and reduced the number of people below the poverty line in any earlier decades. There are about eighteen megacities in 2016 which will increase to twenty-one gigantic megacities of population size ten million and above-called megacities in the Indo-Pacific in 2030, as given in one table below. In 2016 as per UN-Habitat, there were thirty-one megacities in the universe which are likely to be 41 in 2030. Some of the twenty million and above cities are meta cities like Tokyo and soon Delhi, which will overtake Tokyo. The megacity system is defined as functionally and economically interconnected twenty-one or more megacities, servicing sub-national regions and servicing countries outside, sharing the same megacity gateway infrastructure and related economic, institutional, and physical infrastructure of megacities of the Indo-Pacific (Figs. 26, 27 and 28).

These megacities have shown a higher GDP growth rate as shown below.

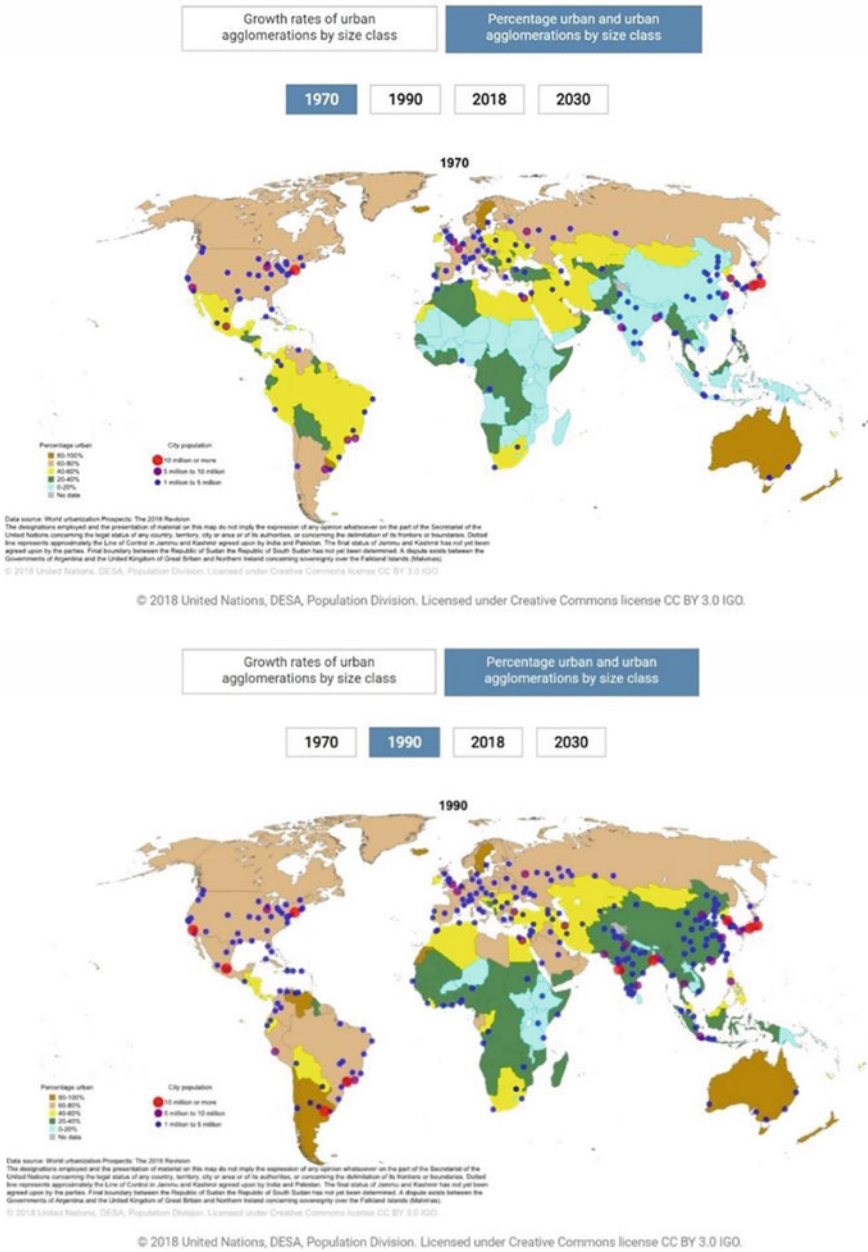


Fig. 22 Growth of Urban Agglomeration by Size 1970 to 2030

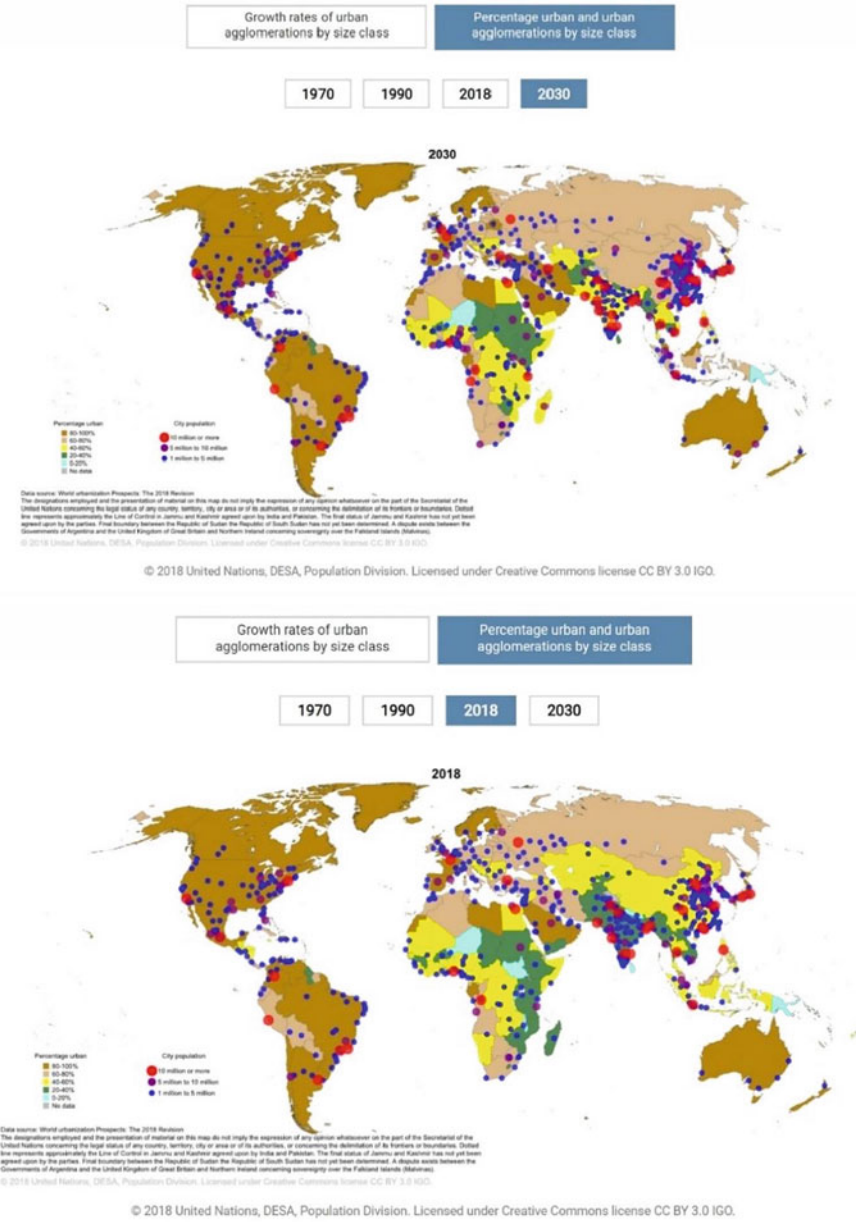


Fig. 22 (continued)

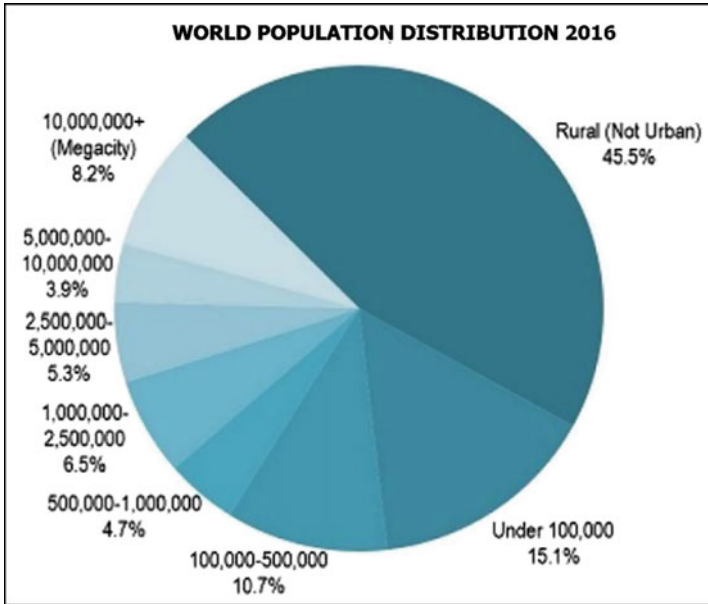


Fig. 23 Population Distribution 2016. *Source* UN-HABITAT

Table 9 Meta cities and megacities population 1950, 1975 the population of cities with ten million inhabitants or more, 1950–75

1950			1975		
	City	Population (million)		City	Population (million)
1	New York-New ark	12.3	1	Tokyo	26.6
2	Tokyo	11.3	2	New York-New ark	15.9
			3	Cludad DE México (Mexico City)	10.7

Source United Nations, Department of Economic and Social Affairs, No. ESA/P/WP/200

In this region, these megacities have a disproportionately higher NDP share, average household income, and expenditure than more miniature cities and villages of the respective Nations assume a significant role in the Indo-Pacific’s regional and international economic development and politics. In the Indo-Pacific region, all leading economies of the world are situated, such as the US, the Peoples’s Republic of China, India, Japan, Australia, South Korea, and ASEAN countries. Others like the UK, France, the Netherlands, and Germany have substantial economic and security concerns and connections in Indo-Pacific and have their National Strategies for the Indo-Pacific.

Table 10 Meta cities and megacities population 1950, 1975, 2000, 2005, 2015 the population of cities with ten million inhabitants or more, 1950, 1975, 2000, 2005, 2015

2000		2005		2015	
City	Population (million)	City	Population n (million)	City	Population (milliomn)
1	Tokyo	1	Tokyo	1	Tokyo
2	Cludad de Mexico (Mexico City)	2	Mumbai (Bombay)	2	Mumbai (Bombay)
3	New York- New Ark	3	Cludad de Mexico (Mexico City)	3	Cludad de Mexico (Mexico City)
4	Sao Paulo	4	Sao Paulo	4	Sao Paulo
5	Mumbai (Bombay)	5	New York-New Ark	5	New York-New Ark
6	Shanghai	6	Delhi	6	Delhi
7	Kolkata a (Calicutta)	7	Shanghai	7	Shanghai
8	Delhi	8	Kolkata (Calcutta)	8	Kolkata (Calcutta)
9	Butanes Aires	9	Jakarta	9	Dhaka
10	Los Angles Long Beach Sanat Ana	10	Buenos Aires	10	Jakarta
11	Osaka-Kobe	11	Dhaka	11	Lagos
12	Jakarta	12	Jakarta	12	Karachi
13	Rio Dejan rio	13	Rio de Janeiro	13	Buenos Aires
14	Al-Qahira Cairo	14	Al-Qahirah (Cairo)	14	Al-Qahirah (Cairo)

(continued)

Table 10 (continued)

2000		2005		2015	
City	Population (million)	City	Population (million)	City	Population (million)
15	Dhaka 10.2	15 Dhaka	10-0.2	15	Los Angeles, Long Beach-Santa Ana 13.1
16	Moskva (Moscow) 10.1	16 Moskva (Moscow)	10.1	16	Manila 12.9
17	Karachi 10.0	17 Karachi	10.0	17	Beijing 12.9
18	Manila 10.0	18 Manila	10.0	18	Rio de Janeiro 12.8
				19	Osaka-Kobe 11.3
				20	Istanbul 11.2
				21	Moskva (Moscow) 11.0
				22	Guangzhou 10.4

Source: United Nations, Department of Economic and Social Affairs, No. ESA/P/WP/200

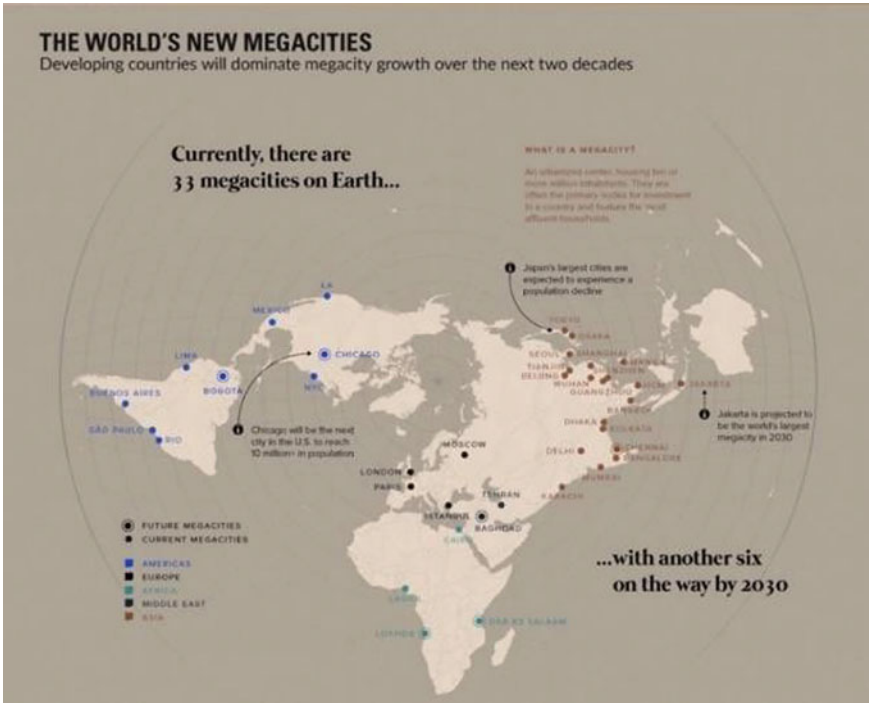


Fig. 24 Megacity Distribution by Continents and population growth of Megacities. Sources <https://visualcapitalist.com>

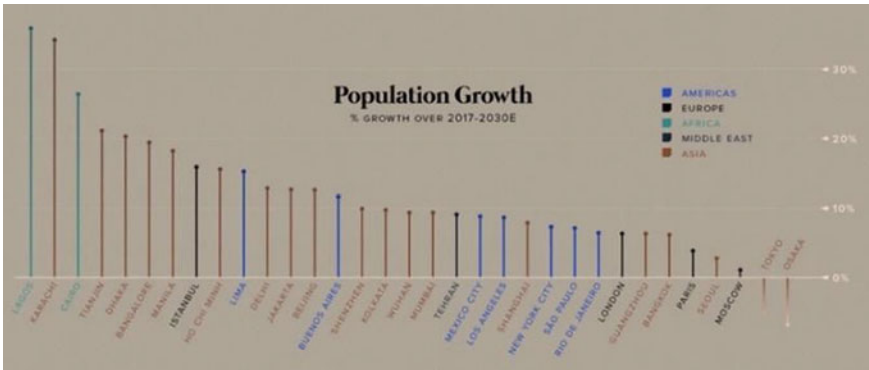


Fig. 25 Population growth rate of megacities in the Indo-Pacific. Sources <https://visualcapitalist.com/>

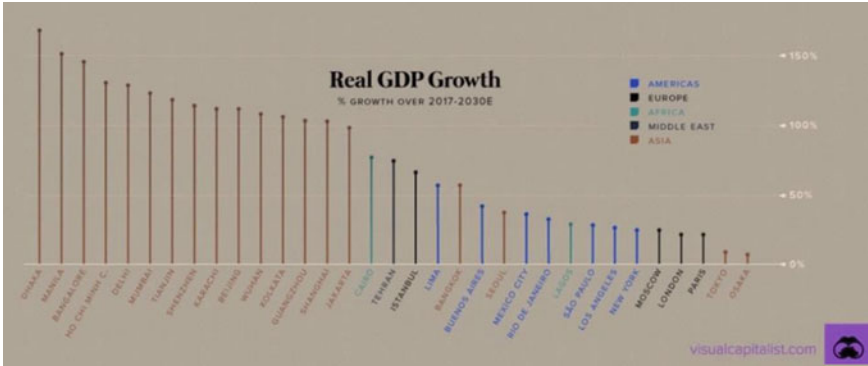


Fig. 26 GDP Growth rate of megacities of the Indo-Pacific. Source <https://visualcapitalist.com/>

These gigantic habitats are significant because it has all the potential to convert themselves into a system of intelligent and global megacities if configured for their sustainability and rapid economic development articulating major concerns like a war against the COVID-19 pandemic, other disaster management such as Tsunami, forest fires, and floods, climate change issues and other security challenges. The vast population, cultural and ecosystem diversity, diverse institutional endowments, supply chain connectivity, global linkages, and size of income and expenditure in these megacities create opportunities for configuring an intelligent global megacity and then progressing toward a system of smart global megacities, which is the subject matter of this book (Tables 11 and 12).

“World Cities Report 2016,” New York

From the above, what exists as megacities in Indo-Pacific is shown.

There are three types of megacities population decelerating, accelerating, and slow growth. As shown in the figure above, Tokyo and other cities are decelerating. The megacity strategies vary consequently (Fig. 29)

4 How Megacity System Works in the Indo-Pacific

Theories of megacities are scholarly ideas to explain how megacities systems function in the Indo-Pacific. Megacities are global and functionally interconnected with each other, and their functioning has been given by many. This is summarized below.



Fig. 27 Megacities in 2014 and Megacities in 2025 by country classification. Source [16]

4.1 Megacity Systems the Connected Global Cities [17]

Global cities existed in ancient times in port cities or cities en route to the silk road where people.

They have assembled from different countries for various purposes. They learned each other’s languages and culture and returned to their country the best they felt, including commercial products. The global population who participated in related

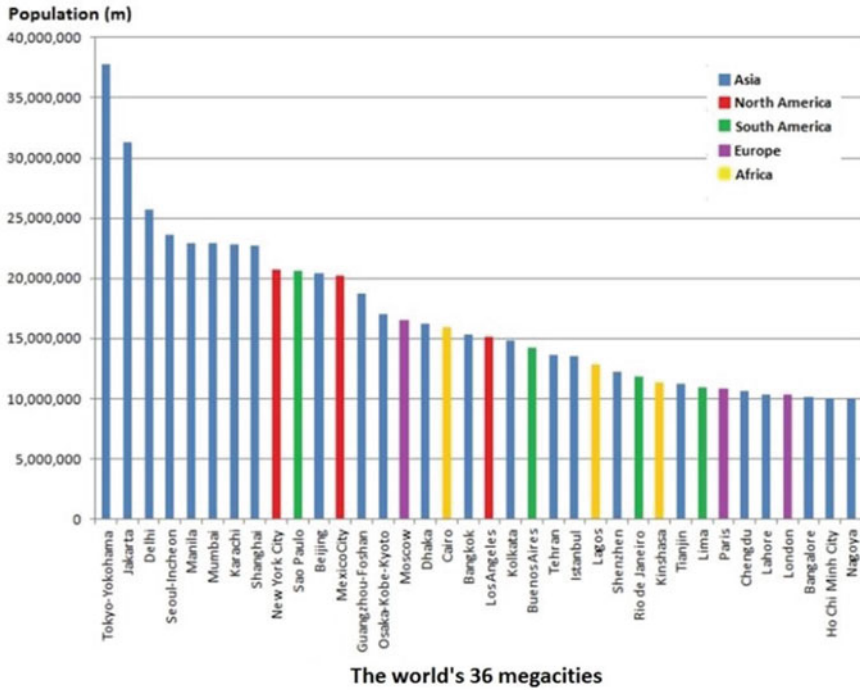


Fig. 28 Population of thirty-five megacities. Source [16]

activities of the ancient historical cities was small, the towns were small, and the intensity of workouts was also small. Things changed drastically with the emergence of megacities, where global economic relations occur with many people participating—communication technologies, such as ICT. IoT and Industries 4 created global cities functionally connected as a system of megacities. This also forms supply chains for high-end technological products. In terms of economic, social, and cultural development, megacities gained due to massive globalization. This interconnected production and services indirectly provided world peace since any war like that of Ukraine would disrupt supply chains and people’s lives and work in cities worldwide. Therefore, the dispute shall be settled through diplomacy and dialogue as soon as possible with the help of world bodies or bodies of country grouping and moved toward a rule-based system. The trade war between the US and China, directly and indirectly, affects the rest of the world and sanctions on Russia, China, and Iran. Still, the result is devastating for the global economy per emerging indicators. In the past, few people interacted, but the intensity of people-to-people interactions in megacities, meta cities, and often metro cities is immense. This is a key to globalization, a state of interconnectedness that transcends and ignores national boundaries. With the emergence of global cities, a dual city region emerged for each global city. One the city region is within the country where the city is located, and the second is outside

Table 11 Megacities and Meta cities 2016–2030

Rank	City, country	Population in 2016 (thousands)	City, country	Population in 2030 (thousands)
1	Tokyo, Japan	38,140	Tokyo, Japan	37,190
2	Delhi, India	26,454	Delhi, India	36,060
3	Shanghai, China	24,484	Shanghai, China	30,751
4	Mumbai (Bombay), India	21,357	Mumbai (Bombay), India	27,797
5	São Paulo, Brazil	21,297	Beijing, China	27,706
6	Beijing, China	21,240	Dhaka, Bangladesh	27,374
7	Ciudad de México (Mexico City), Mexico	21,157	Karachi, Pakistan	24,838
8	Kinki M.M.A.(Osaka), Japan	20,337	Al-Qahirah (Cairo), Egypt	24,502
9	Al-Qahirah (Cairo), Egypt	19,128	Lagos, Nigeria	24,239
10	New York, Newark, USA	18,604	Ciudad de México (Mexico City), Mexico	23,865
11	Dhaka, Bangladesh	18,237	São Paulo, Brazil	23,444
12	Karachi, Pakistan	17,121	Kinshasa, Democratic Republic of the Congo	19,996
13	Buenos Aires, Argentina	15,334	Kinki M.M.A.(Osaka), Japan	19,976
14	Kolkata (Calcutta), India	14,980	New York-Newark, USA	19,885
15	Istanbul, Turkey	14,365	Kolkata (Calcutta), India	19,092
16	Chongqing, China	13,744	Guangzhou, Guangdong, China	17,574
17	Lagos, Nigeria	13,661	Chongqing, China	17,380
18	Manila, Philippines	13,131	Buenos Aires, Argentina	16,956
19	Guangzhou, Guangdong, China	13,070	Manila, Philippines	16,756
20	Rio de Janeiro, Brazil	12,981	Istanbul, Turkey	16,694
21	Los Angeles-Long Beach-Santa Ana, USA	12,317	Bengaluru, India	14,762
22	Moskva (Moscow), Russian Federation	12,260	Tianjin, China	14,655
23	Kinshasa, Democratic Republic of the Congo	12,071	Rio de Janeiro, Brazil	14,174
24	Tianjin, China	11,558	Chennai (Madras), India	13,921
25	Paris, France	10,925	Jakarta, Indonesia	13,812

(continued)

Table 11 (continued)

Rank	City, country	Population in 2016 (thousands)	City, country	Population in 2030 (thousands)
26	Shenzhen, China	10,828	Los Angeles-Long Beach-Santa Ana, USA	13,257
27	Jakarta, Indonesia	10,483	Lahore, Pakistan	13,033
28	Bengaluru, India	10,456	Hyderabad, India	12,774
29	London, UK	10,434	Shenzhen, China	12,673
30	Chennai (Madras), India	10,163	Lima, Peru	12,221
31	Lima, Peru	10,072	Moskva (Moscow), Russian Federation	12,200
32			Bogotá, Colombia	11,966
33			Paris, France	11,803
34			Johannesburg, South Africa	11,573
35			Krung Thep (Bangkok) Thailand	11,528
36			London, UK	11,467
37			Dar es Salaam, United Republic of Tanzania	10,760
38			Ahmadabad, India	10,527
39			Luanda, Angola	10,429
40			Thành Pho Ho Chí Minh (Ho Chi Minacity), Viet Nam	10,200
41			Chengdu, China	10,104

Source United Nations, 2016 “World Cities in 2016 Data Booklet,” New York. United Nations, 2016

the country interacting with global megacities, systems of global megacities, or even international subregions. The economic interaction from outside the city region will often be more dominant and dynamic in terms of money transacted than inside the city region. This economic interaction that leads to manufacturing and trading in the highest quality and globally standardized goods and services at the lowest cost to consumers who have the immense choice to shape their quality of living was the result of globalization. The country-specific regulations that restrict the easy flow of goods and services are discussed and solved mutually by the countries involved, as seen in the current negotiation with China and India, and the US or deliberations in the World Trade Organization. Such arrangements create a division of labor across city regions transcending country boundaries and sharing the economic responsibilities as per capabilities at lower costs. Global urban economies benefited greatly from advanced and standardized producer services such as finance, banking, insurance,

Table 12 Megacities and meta cities in the Indo-Pacific 2016–2030

Rank	City, country	Population in 2016 (thousands)	City, country2	Population in 2030 (thousands)
1	Tokyo, Japan	38,140	Tokyo, Japan	37,190
2	Delhi, India	26,454	Delhi, India	36,060
3	Shanghai, China	24,484	Shanghai, China	30,751
4	Mumbai (Bombay), India	21,357	Mumbai (Bombay), India	27,797
5	Beijing, China	21,240	Beijing, China	27,706
6	Kinki M.M.A.(Osaka)Japan	20,337	Dhaka, Bangladesh	27,374
7	Dhaka, Bangladesh	18,237	Karachi, Pakistan	24,838
8	Karachi, Pakistan	17,121	Kinki M.M.A.(Osaka)Japan	19,976
9	Kolkata (Calcutta), India	14,980	Kolkata (Calcutta), India	19,092
10	Chongqing, China	13,744	Guangzhou, Guangdong, China	17,574
11	Manila, Philippines	13,131	Guangdong, China	17,574
12	Guangzhou, Guangdong, China	13,070	Chongqing, China	17,380
13	Los Angeles-Long Beach-Santa Ana, USA	12,317	Manila, Philippines	16,756
14	Tianjin, China	11,558	Bengaluru, India	14,762
15	Shenzhen, China	10,828	Tianjin, China	14,655
16	Jakarta, Indonesia	10,483	Chennai (Madras), India	13,921
17	Bengaluru, India	10,456	Jakarta, Indonesia	13,812
18	Chennai (Madras), India	10,163	Los Angeles-Long Beach, Santa Ana USA	13,257
19			Lahore, Pakistan	13,033
20			Hyderabad, India	12,774
21			Shenzhen, China	12,673

Source United Nations, 2016 “World Cities in 2016 Data Booklet,” New York. United Nations, 2016

logistics, law, management consultancy, advertising, and other services, generating various local employment opportunities that never existed before globalization.

There was also a demand related to skilling. It further triggers technological development and a higher level of professional service capability. The intranational flow of capital becomes much easier with research in Fintech based on the internet, such

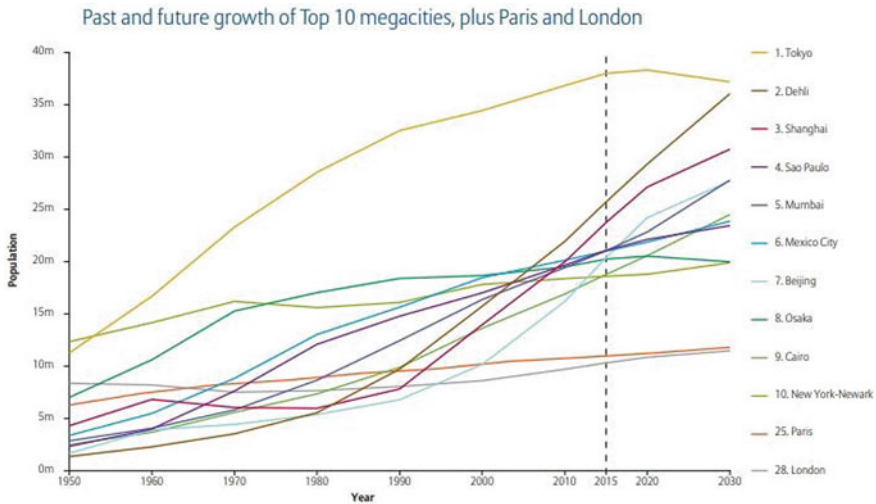


Fig. 29 Population growth patterns of selected megacities. *Source* United Nations Population Division: World Urbanization Prospects 2014 edition 24–4-2022

as SWIFT and UPI. The technology revolution and uniformity of standard practices have made it possible for business enterprises to hire these services anywhere in the world. The intense use of ICT in smart cities has a crucial role. Towns in the Indo-Pacific have taken advantage of this to provide customer services at highly competitive rates by drawing on a large labor force at low pay rates. Unfortunately, this trend contributes to the creation of divided cities, with this professional class earning a higher income with superior skill compared to locally employed labor forces from a local source of traditional economic activities. This can create a high standard of living in a gated community of the rich adjacent to slums with inadequate housing and infrastructure provision, another symptom of divided cities. Protectionism can emerge as an opposing force against globalization and irrational migration policies, eventually leading to the country's lower economic development and isolation of such countries. Such a situation can be avoided if legislators and policymakers can evolve acceptable solutions acceptable to all beyond vote bank solutions. This big political challenge is thrown at legislators and policymakers who must be more knowledgeable about globalization.

Examples of cities that have become hubs of global economic activity are.

1. Finance—Frankfurt, Hong Kong, Amsterdam, Singapore, Sao Paulo, Shanghai.
2. Transport—Dubai, Rotterdam.
3. Information technology—Bengaluru, Seattle, Silicon Valley.

Once the sole domain of Europe and North America, world cities are emerging in the Indo-Pacific and outside to compete with long-established capitals of commerce. Istanbul and Mumbai are culturally influential within their regions through Bollywood and Turkish films, literature, satellite TV networks, and other forms of

entertainment. Nairobi, Addis Ababa, and Bangkok, among others, host regional headquarters for international agencies and development partners. Megacities have become the seat of education and research, bringing out innovations attracting students and Professors from across the country.

4.2 Global Functions of Megacities [18–24]

Megacities influence globally with economic, financial, physical, communication, and cultural linkages. Urban growth with severe problems, such as congestion, pollution, social segregation, Terrorism, or high crime rates, threatens the achievement of sustainable urban development. Megacities across the globe are engaging in an intense search for strategies to address these issues. Megacities need immediate solutions for better public transportation, public realm development, energy, solid waste disposal, air and water pollution, or water supply. The critical role megacities play in this context is two-fold: they represent the centers where economic and social change occurs and function as crucial ‘actors’ behind these changes. Globalization and intense deployment of ICT in cities together result in the increasing importance of megacities at the very top of the hierarchy, the so-called world cities or global cities.

4.3 Five Phenomena of Global Megacities [25, 26]

1. Innovation capacity and the potential for economic development reside in a large part of a megacity. Research-intensive industries and knowledge-based services are increasingly concentrated in megacities since there are reputed Universities and Research Institutions there.
2. Megacities enable innovative companies to exploit opportunities and establish contacts while allowing them to access information and reduce risks. In addition, megacities also provide access to specialized resources and employees and specific routines, traditions, values, and other local institutions. Megacities are characterized by a high degree of economic, social, and cultural complexity, functionally interconnected and embedded in the global division of labor. On the other hand, they constitute the nodes of overlapping financial flows as well as trade, production, political, cultural, and social networks cutting across national boundaries. Innovation capacity and the potential for economic development reside predominantly in megacities.
3. The national hierarchy of cities and the division of labor within the national economy has a counterpart in a global division of labor transcending country boundaries. Megacities become part of an emerging international hierarchy based on a competitive division of work worldwide by international connections that affect financial flows in the knowledge-intensive service sector. It leads to the

emergence of a vertical hierarchy of a globalized system of megacities. The relationship between spatial decentralization and territorial concentration alters the position of peripheral areas in this emerging spatial structure. Unbalanced spatial development reinforces the regional character through expansion, stagnation, and negative growth. Highly skilled employment, high-value infrastructure, and investment co-exist in large megacities.

4. Megacities align their specialization with the global division of labor and forge links with other dynamic megacities. Interconnections between megacities, their hinterlands, and immediate surrounding (structurally weak) areas may decrease and become increasingly disconnected from economic development. This adverse development calls for institutional structures that extend beyond the megacity level.
5. Megacities as economic development hubs generate changing spatial patterns impacting institutional action within the state hierarchy. Devolution of State powers to transnational levels leads to a newly constituted tier of the megacity and megacity regional governance.

Considering the growing importance of megacity regions, the need for adequate organizational structures ('for megacity governance') emerge in megacity and megacity regions.

4.4 World Cities and Global Cities [27–30]

In his book, *Cities in Evolution*, Patrick Geddes coined the term “world city” in 1915. Geddes taught biology at the University of Dundee and advised India’s rulers on how to run their cities.

World cities are characterized by a sum of political power (both national and international) and organizations related to government; national and international trade, whereby cities function as a gateway for their own and sometimes also neighboring countries; providing superior banking, insurance, and related financial services; advanced professional activities of all kinds; information gathering and diffusion. The form and extent of a city’s integration with the world economy and the functions assigned to the town in the new spatial division of labor will be decisive for any structural changes within it. Key cities throughout the world are used by global capital as bases—points in the spatial organization and articulation of production and markets. The resulting linkages make arranging world cities into a complex spatial hierarchy possible. The global control functions of world cities are directly reflected in the structure and dynamics of their production sectors and employment. They are important sites for the concentration and accumulation of international capital.

They are points of destination for many domestic and international migrants. World city formation brings into focus the significant contradictions of industrial capitalism, including spatial and class polarization. World city growth generates social costs at rates that tend to exceed the state’s fiscal capacity—conspicuous consumption: arts, culture, and entertainment and the ancillary activities that cater

to them. Three main functions of world cities are headquarters function, financial center function, and articulator cities that link a national or regional economy to the global economy.

The world cities hypothesis of Freidman is enumerated below.

1. The nature of a city's integration with the world economy is decisive for any structural changes. It is occurring within it.
2. Key cities throughout the world are used by global capital as 'basing points for the organization of production and markets.'
3. The global control functions of world cities manifest in their industrial structure and job markets.
4. World cities are significant sites for the concentration and accumulation of capital.
5. World cities are destinations for large numbers of migrants—both domestic and international.
6. World city formation exposes the significant contradictions of industrial capitalism, particularly spatial class polarization.
7. World city growth generates social costs that exceed the state's fiscal capacity.

Modern technologies, telecommunications, and information technology have led to decentralization and agglomeration of economic activities. This combination of spatial dispersal and global integration has created a new strategic role for major cities, thus leading to a new type of city (different from historical banking and trade centers).

4.5 *Global Cities by Saskia Sassen [31, 33, 34, 43]*

Global cities, for Sassen, form a 'virtual economic cycle' and function in four new ways: the demand for control creates cities as 'command points'; this leads to a request for finance and business services, whereby cities become the 'key locations' for leading economic sectors; cities become sites of production and innovation for these leading economic sectors; cities constitute markets for primary economic sector production.

Saskia Sassen's Global City Hypothesis

1. First, the geographic dispersal of economic activities that marks globalization and the simultaneous integration of such geographically dispersed activities is a critical factor in feeding the growth and importance of central corporate functions. The more distributed a firm's operations across different countries, the more complex and strategic its main parts are—managing, coordinating, servicing, and financing a firm's network of operations.
2. These central functions become so complex that increasingly the headquarters of large global firms outsource them: they buy a share of their primary tasks from highly specialized service firms—accounting, legal, public relations, programming, telecommunications, and other such services.

3. Third, those specialized service firms engaged in the most complex and globalized markets are subject to agglomeration economies.
4. The more headquarters outsource their most complex, unstandardized functions, particularly those subject to uncertain and changing markets, the more accessible they are to opt for any location because less work done in the headquarters is subject to agglomeration economies.
5. These specialized service firms need to provide a global service which means a worldwide network of affiliates or some other form of partnership. As a result, we have seen a strengthening of cross-border city-to-city transactions and networks. At the limit, this may well be the beginning of the formation of transnational urban systems. The growth of global markets for finance and specialized services, the need for transnational servicing networks due to sharp increases in international investment, the reduced role of the government in the regulation of international economic activity, and the corresponding ascendancy of other institutional arenas—notably global markets and corporate headquarters—all point to the existence of a series of transnational networks of cities.
6. A sixth hypothesis is that the growing numbers of high-level professionals and high profit-making specialized service firms raise the spatial and socio-economic inequality evident in these cities. These technical services' strategic role as inputs increases top-level professionals' value and numbers. Further, the fact that talent can matter enormously for the quality of these strategic outputs and given the importance of speed, proven talent is an added value, the structure of rewards is likely to experience rapid increases.
7. A seventh hypothesis is that one result of the dynamics described in hypothesis six is the growing informalization of a range of economic activities which find their effective demand in these cities yet have profit rates that do not allow them to compete for various resources with the high profit-making firms at the top of the system. Informalizing part of or all production and distribution activities, including services, is one way.

Saskia Sassen never considered the potential of a megacity or megacity system as an extensive reservoir of multitudes of specialized supplies of products and services required for global business operations under one single megacity or a system of megacities but was looking at a much smaller scatter of several cities including metropolitan cities, which was what existed before the 1990s.

4.6 Seven Types of Global Cities [35]

The report, “Redefining global cities: The seven types of global metro economies,” by Brookings Fellow Joseph Parrilla and former Brookings Research Analyst and Associate Fellow Jesus Leal Trujillo, uses a first-of-its-kind database of dozens of indicators to examine the global city economy.

Characteristics, industrial structure, and critical competitiveness factors: tradable clusters, innovation, talent, and infrastructure connectivity. Their analysis focuses on the 123 largest metropolitan economies in the world, which collectively account for one-third of global GDP despite containing only 13 percent of the worldwide population. Analysis of these data reveals seven types of global cities—the Global Giants, Asian Anchors, Emerging Gateways, Factory China, Knowledge Capitals, American Middleweights, and International Middleweights—each with distinctive assets, challenges, and growth trajectories. “This report provides fresh evidence that there is no one way to be a global city,” Parrilla said. “Cities that understand their unique niche in the global economy are better positioned to create economic strategies that will be successful in the long-term.” The accompanying online interactive report uses the typology to help megacity decision-makers understand the local assets that drive economic competitiveness, benchmark their performance against peer cities, and identify the most relevant global innovations for regional growth and prosperity (Fig. 30).

1. Global Giants: six large, wealthy hubs with concentrations of corporate headquarters; they serve as the command-and-control centers for the world’s largest advanced economies.
2. Asian Anchors: five large business and financial nodes anchoring inward investment into the Asia–Pacific and Russia.
3. Emerging Gateways: twenty-eight large businesses and transportation entry points for major national and regional emerging markets in Africa, Asia, Eastern Europe, and Latin America.
4. Factory China: twenty-two second and third-tier Chinese cities distinctly reliant on export-intensive manufacturing to power economic growth and global engagement.
5. Knowledge Capitals: nineteen mid-sized, highly productive knowledge creation centers in the United States and Europe with talented workforces and elite research universities.
6. American Middleweights: sixteen mid-sized US metro areas were striving for a post-recession niche in the global economy.
7. International Middleweights: twenty-six mid-sized cities in Australia, Canada, and Europe are globally connected by people and investment flows, but growth has lagged after the fiscal crisis.

4.7 Connected Global Cities [36, 37]

We are all living in a globalized world. The world is interconnected, and the policies of one country, rational or irrational, affect others and megacities. With America, the First Policy of the USA under President Donald Trump and Brexit in the UK, which divorces the UK from the European Union, migration policy, trade policies, custom union issues, and tariffs as an economic weapon against saying China for the

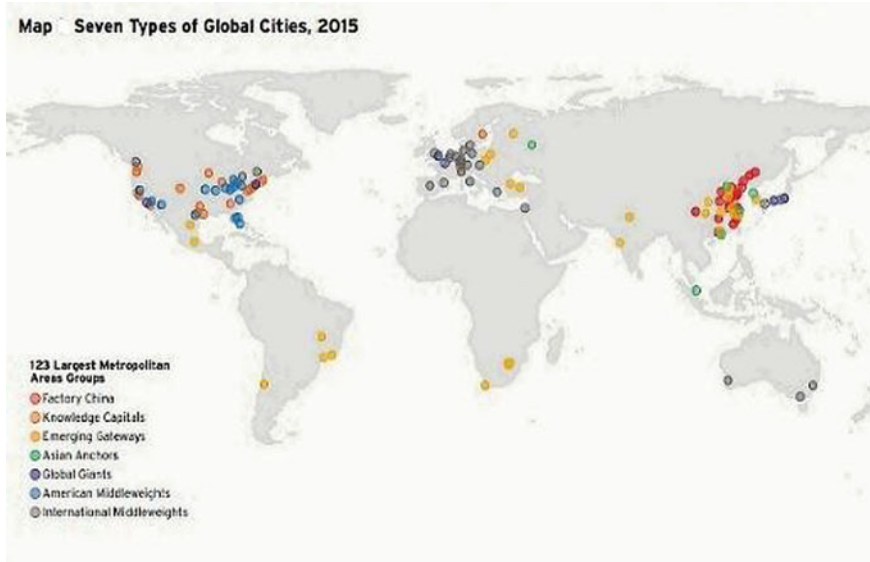


Fig. 30 Typology of Global Cities 2015. *Source* [35]

balance of payment issues have gained considerable attention. Democrat opposes what Republican advocates in the US and vice versa. Germany is more tolerant than some other European Union countries. Switzerland remains a country with a better immigration policy than others. Undoubtedly, there will be retardation in economic development for irrational policies, which will not be limited to a few countries but all countries in a very connected world.

“Since 1998, the Globalization and World Cities (GaWC) Research Network has extensively studied the impact of world cities on globalization. GaWC provides a geographic and economic-based overview of the world and is evolving configuration. GaWC is a research network based in the Geography Department at Loughborough University (UK), founded by Peter J. Taylor in 1998.

Particularly relevant in this discourse is its categorization of world cities into α , β , and γ tiers based on their international connectedness. Suppose the world is observed from the point of view of the connectivity of the world cities. In that case, a new image emerges, where each city is oriented to other cities of the same level of interconnectivity. National or continental maps give way to a new world configuration intended as an archipelago, where each town appears utterly separated from its surroundings and closer to other cities of the same level. The leading parameters for the new configuration are based on mutual connections, primarily in the global economic system. The atlas shows the world’s cities according to the GaWC categorization 2010. A new configuration emerges from this, where expected national and local boundaries are presented in their natural disposition based upon their international connectedness” (Fig. 31).

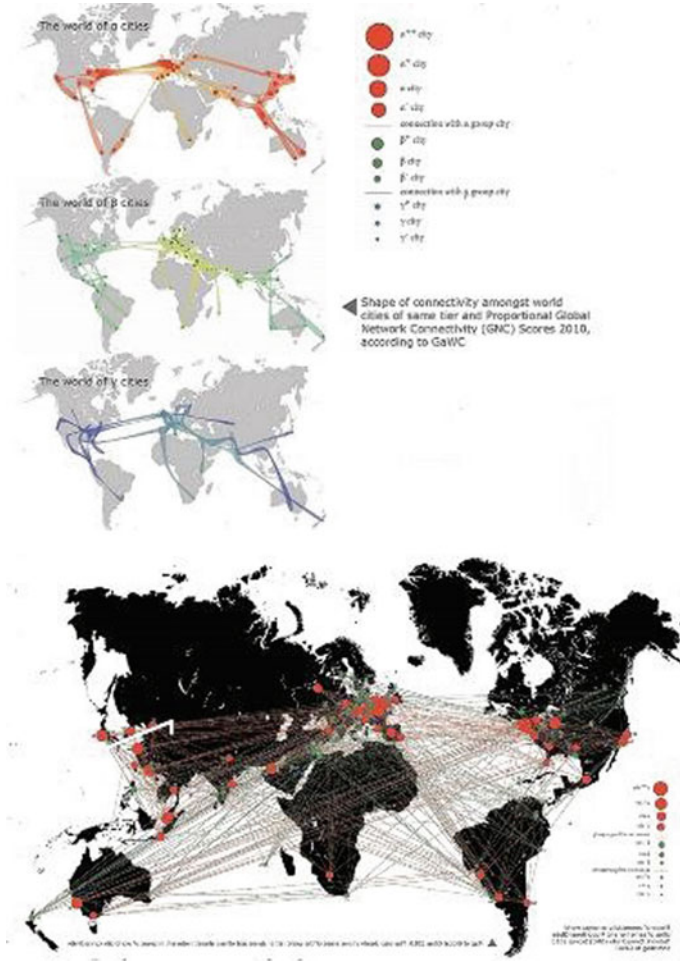


Fig. 31 Alpha, Beta, and Gamma Cities. *Sources* Classification of cities: Classification of GaWC 2010. Geography Department, Loughborough University. <http://www.lboro.ac.uk/gawc/world2010t.html>—Global network connectivity scores 2010: Geography Department, Loughborough University. City codes: GaWC Research Bulletin 355. <http://www.lboro.ac.uk/gawc/rb/rb355.html>

“Every few years, cities are rated ranked by the Globalization and World Rankings Research <http://www.lboro.ac.uk/gawc/Institute>. It is considered the leading institute ranking in world cities. Cities are ranked into Alpha, Beta, and Gamma cities by considering many factors; economic factors are deemed more important than cultural or political factors though in this ranking. Here is a list with the latest data from 2016 (GAWC has not done a study in 2017 or 2018). Spotted by Locals cities (most of “our” 71 cities are listed) are linked. Alpha + + world cities: London, New York.

Alpha + world cities: Singapore, Hong Kong, Paris, Beijing, Tokyo, Dubai, Shanghai.

Alpha world cities: Sydney, Sao Paulo, Milan, Chicago, Mexico City, Mumbai, Moscow, Frankfurt, Madrid, Warsaw, Johannesburg, Toronto, Seoul, Istanbul, Kuala Lumpur, Jakarta, Amsterdam, Brussels, Los Angeles.

Alpha – world cities: Dublin, Melbourne, Washington, New Delhi, Bangkok, Zurich, Vienna, Taipei, Buenos Aires, Stockholm, San Francisco, Guangzhou, Manila, Bogotá, Miami, Luxembourg, Riyadh, Santiago, Barcelona, Tel Aviv, Lisbon.”

4.8 Thomas Friedman’s World is Flat and Thanks for Being Late and Global Megacities in Indo-Pacific [38, 39]

Thomas Friedman’s idea that the world is flat is applied here in the Indo-Pacific. Globalization. He visualizes as the flattening of the world, and we attempt to show how it can happen in the system of megacities in the Indo-Pacific. Smart global megacities are ideal places in the Indo-Pacific where flattening should occur. He says the world’s flattening is achieved through the convergence of often political events, innovations, and companies. The political events are the initiatives of QUAD in the Indo-Pacific and other country Indo-Pacific Policies.

Flatteners 1: 11/9/89 when the Walls Came Down, and the Windows went up. Friedman refers to the fall of the Berlin Wall, which is merely a symbol from the point of view of the Indo-Pacific global city. Before this date, there were two ways of planning a global megacity, namely the socialist/communist way and the democratic way with the market economy. Soon after that date, the Soviet Union disintegrated, and China moved closer to following the capitalist market economy with its bible as the WTO rule book. In the Socialist/Communist way of megacity planning, the Communist Party, staffed mainly by a single party system, decides what to produce and what services to be developed in a megacity with no consideration about what happens in a market economy within or outside the country and everything conforming the ideology of socialism or Marxism or Maoism or any autocrats “isms by his name” of the socialist government. The targets are made as postulated by Planning Commission or Board. Planning and procedures for implementation are formulated for administrators subjectively; more tax from the rich was collected, and the bureaucracy implemented it using tax collected and using a licensing system with highly restrictive controls, which resulted in inefficiencies out of ignorance of markets and human behavior, encourages and often giving patronages to massive corruption of political and administrative persons and resulting in slow economic growth and much slower poverty reduction. These happened in India before 1991 when India tried to copy the Soviet Union with a socialism tag which they learned from their colonial masters, the British, when their leaders were university students in the UK. The biggest problem of the command economy is that they are prisoners of an ancient theory of Marxism, a product of the ills of the first industrial revolution in the UK. Still, the British never allowed the industrial revolution to happen in India

as a British colony, not considering what was happening globally in colonies of past empires and post-colonial countries in an ever-changing world. There have been many industrial revolutions, and Marxism is not a satisfactory answer to the fourth industrial revolution that follows today. As a result, the Marxist party in India has less membership trending toward disappearance in the Indian Parliament, and only one state with less than 3% of the population of India is ruled by them at the rate of once in ten years. Indians have written off Marxism since 1990, but Marxist leaders who misdirect uneducated people have yet to realize that (Fig. 32).

This has resulted in the symbolic breaking of the Berlin Wall by people who protested the slow progress of economic development in countries under socialism, threatening monetary situations toward bankruptcy and more incidence of abject poverty. This increased democratic power for people to decide what they want, how their jobs should evolve, and how they will integrate with the world. In a democratic global city, people and communities determine what is good for them based on emerging facts, and they interact with the local and international community; they invest their money and run the production of goods and services as per their perception and initiative within the rights available under the constitution fully prepared to face any risks. In such a setup, licensing and control of socialist bureaucracy were reduced to minimal regulations to protect all. India practiced the socialist way strictly until 1991 and found poverty never came down, and the growth rate never went up more than 3% India was going to be a bankrupt Nation for the first time in 1991. In 1991 the existing Indian government moved to the democratic way of governance and found growth rates going up to 8 and 9%. Poverty was reduced faster by removing license raj and related bureaucratic heavy-handed controls and planning board-designed subjective procedures called administrative rules. Subsequently, the Planning Commission was dissolved by the Union Government of India and replaced by a policy research think tank called Niti Aayog. This is more useful and productive than subjective administrative rules and targets set by the Planning Commission based on some

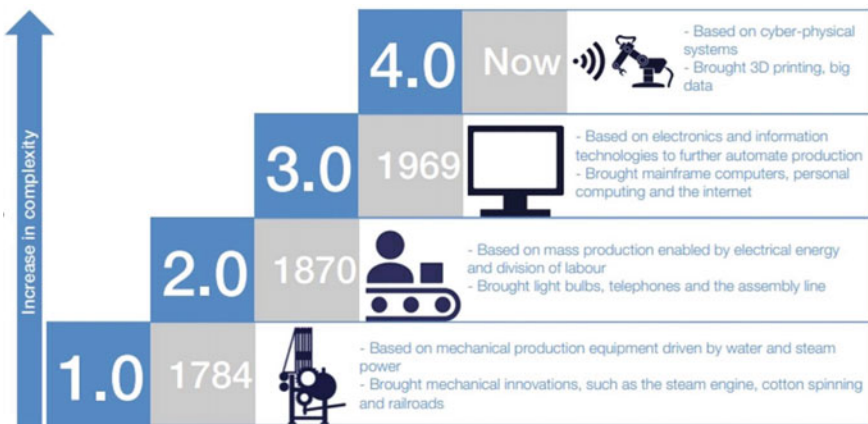


Fig. 32 Industry 1, 2, 3, and 4. Source Author

abstract ideas they got from the UK and USSR not supported by empirical research in 24 h and seven days week framework. This means all households in the intelligent global megacity should be empowered, so also local face-to-face communities for economic, social, spatial, environmental, and cultural development with few administrative restrictions and licensing under the constitution of rights enshrined there. The Government, Chamber of Commerce and Industries, and Academia can lead in supporting households and the local community. Under socialism and communism, global-city-information dissemination was restricted and not freely available to all but to a privileged few. With the rise of the internet, information was open freely to people leading them to decide on actions and soon to adjust themselves to global production and services, aligning them to common standards globally acceptable. With the advent of TV, journalism, and mass media, people and households have started knowing what was happening. They started communicating their views and finding opportunities without dictation from parties, planning boards, commissions, and administrators.

Flattener #2 8/9/95 When Netscape Went Public.

The concept of the World Wide Web as a system for creating, organizing, and linking all types of documents so they could be easily browsed was first created by British Computer Scientist Tim Berners-Lee in 1991. It became a reality for public use when Netscape was produced, and the company tried to market it as a commercial web browser by Netscape. The immense possibility of WWW triggered development in fiber-optic networks worldwide at an unimaginable speed that can carry a massive amount of data connecting the whole universe. Then PC and Mac's computers started their accelerated growth path by increasing capabilities and reducing costs by incorporating web browsers independent of the operating system. These were free and triggered by the thought that consequent increasing users meant higher profitability in commercial returns, and entrepreneurs invested in the network infrastructure of fiber-optic cables by entrepreneurs that created the WWW infrastructure meant for increasing business activities globally. Every office needed to interact with workers through the computer using a local area network. With the internet, this office expands globally to the universe transferring all types of data, voice, music, images, movies, and messages at almost zero cost. It was widely used for emails and information sharing across the world for a multitude of businesses (Fig. 33).

This development was significant to smart global megacities. The megacity can be developed, managed, and monitored through the internet. All global economic activities scattered worldwide can use the internet for the global economic development of the megacity by all citizens and communities. Here the size of the city does not matter whether it is a megacity or meta city; the amount of information movement does not matter, and what matters is global economic development using a megacity which is also a digital city intensively using ICT in emerging smart or digital city. This flattening gave rise to the foundation of the smart global megacity. This movement was done fast because all required was free or almost free. The Berlin Wall we discussed above needs to be broken down before the advent of free Netscape, and both cannot co-exist.

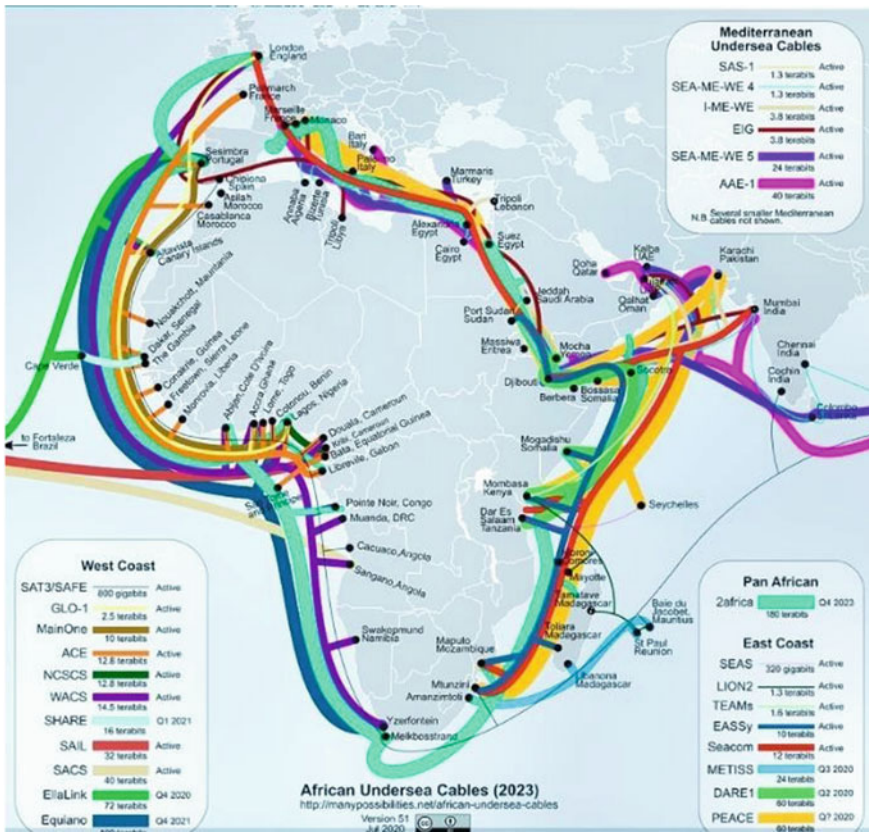
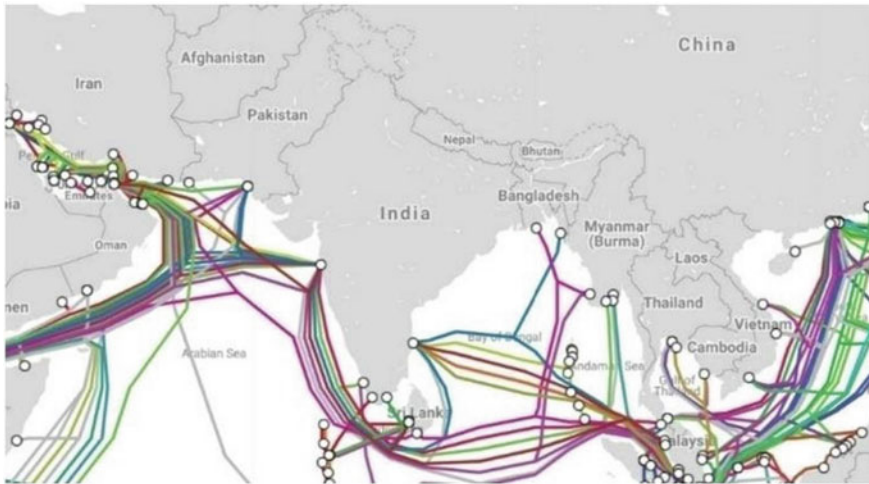


Fig. 33 Fiber Network India and Africa

Flattener #3 Workflow Software.

Workflow software is internet-based software where work can be shared from multiple locations globally. GIS and CAD are used in megacity digitization, monitoring, and production of a spatial decision support system that can be used and implemented from multiple locations for many purposes, including commercial and industrial. Products and services can also be designed, and prototypes generated at various locations using web-based workflow programs. Many GIS Wenders and open-source Linux have their brands of such free software. This became the backbone of the global supply chain in fields like culture, visual art, and movie-making. Workflow software soon moved to automation using artificial intelligence. World-wide collaboration and sharing economy, two pillars of the smart global megacity system, got institutionalized with workflow software based on the digitization of everything.

Flattener #4 Open-Sourcing Self-Organizing Collaborative Communities

A self-organizing, smart, and collaborative economic community is the building block of smart global megacities. The open-source software movement used the World Wide Web and professionals who wanted to freely contribute their capabilities to make software and web browsers that can be freely used and whose source code is available to all for modification and improvement. This self-organizing smart community had its management system to organize. It produced the most outstanding software for a variety of tasks. Using Fab Lab and freeware CAD-CAM software, any smart community can deliver exceptional, innovative products that may not exist today. Often private companies shared their software and joined with the open-source movement accepting their code of conduct. Thus, Samsung Smart Things, which provides a hub for smart thing IoT smart home automation, which is very much used in the smart global city, is progressing much faster in software development than other commercial software not using Open sourcing. Amazon's Alexa is also another example whose SDK is readily available for one to design and use Alexa for one use. The result is cheaper products and services and more accessible to people. Often the same company gives out such software free of cost. The marginal cost of production near zero is one of the approaches to an intelligent city economy, and the open-source movement is the first practitioner of this philosophy. It is the first post-capitalist and post-socialist model of shared community products and services. The Governing structure of the open-source movement is self-governance, and it is a model for megacity governance. For smart global megacities, Open sourcing and self-organizing communities are the foundation for smart global megacity economic development and smart living.

Flattener #5 Outsourcing Y2K

According to Thomas Friedman India, the second buyer buys a hotel, a mall, a golf course, or an industry at 10% of the cost when the first owner grows bankrupt. Here the first owner is those fiber-optic cable companies that produced a giant global network undersea to carry digital information of unimaginable quantity, assuming that Netscape going commercial can reap huge profits unimaginable before. Still, all the web browsers that subsequently came up wanted it to be free so that it could

attract more information traffic for fiber-optic that helps other commercial ventures, and this created a situation where the whole WWW industry became free, which necessitated selling the fiber-optic network cheap or for at no cost since there is no possibility of web browser going commercial. Indians did not purchase the share of fiber-optic companies, but they and their American clients benefited from the over-capacity creation and used it almost free. They could use these resources because of the English-educated Science, technology, engineering, and mathematical graduates they produced in abundance and who found unemployed under socialism and the militant labor force they created for the vote bank. So, America, in turn, became the second buyer of Indian capability at a much lower cost of university education than available in their own country, which could not find suitable jobs under the “Berlin Wall” socialist mixed-up economy. In addition to fiber-optic, the Y2K crisis that the computer industry faced was a blessing for India to start in the knowledge economy. The early start of many companies gave Indians educated an alternative future in their own country, which the Soviet Russia model of command economy practiced before 1991 could not provide. The alternative was a migration to another country which they did but is now being opposed by USA First and movements like Brexit and other nationalistic and right-wing migration policies. The start-up culture and shared infrastructure owned by the community became another building block because some of them became one-billion-dollar Unicorns in Bengaluru of the intelligent economy of a smart global megacity from this flattener. This also gave the smart global megacity the art of becoming a knowledge-based industry entrepreneur breaking free from the Berlin Wall, socialism, or old and outdated capitalism.

Flattener #5 Offshoring. Running with Gazelles. Eating with Lions

On December 11, 2001, China joined the World Trading Organization, which means China accepted world trade as a rule-based activity and eventually became the world’s factory. The spirit behind such transformation was summarized in a saying written in a Chinese factory, as reported by Friedman.

“Every morning in Africa, a gazelle wakes up.
It knows it must run faster than the fastest lion, or it will be killed. Every morning a lion wakes up.
It knows it must outrun the slowest gazelle, or it will starve to death. It does not matter whether One is a lion or a gazelle.
When the sun comes up, One better start running.”

This is the spirit behind China becoming a factory of the world. One cannot see the Berlin Wall discussed above and Marxism, Leninism, and Maoism. There is no Communist Party or Planning Commission but the people’s Republic of China’s simple, unadulterated autocratic capitalism. We also saw in Russia an Autocratic Oligarchical Capitalism replacing socialism after the breakup of the USSR but adding a democracy tag with periodic elections during Deng’s era.

Offshoring is a process in which a foreign company moves stock and barrel the entire factory production to another country to take advantage of lower factors of production such as labor, water, energy, space, and infrastructure cost, for example,

and produce the product much cheaper than made at home and reap the benefit in the world market. China came forward as a destination for offshoring. It made itself suitable when it joined the World Trade Organization and accepted a rule-based system from a communist system where the party decides what is good, often in an arbitrary manner with so-called superior knowledge of the supreme party leader. It had about 160 million-plus population in metro and megacities cities on the east coast near harbors to accommodate offshoring with necessary infrastructure. The leadership of Deng, who proclaimed it does not matter the color of the cat and what matters is the capacity to catch a mouse, made China more accommodative and adaptable to offshoring by removing bureaucratic controls characteristic of the socialist economy but supporting most efficiently all such attempts in offshoring. These attracted significant offshoring from the USA, Europe, Taiwan, and Japan to China. Instead of China making itself statuesque, it became more dynamic. The vast Chinese population became students in Western universities and became innovators themselves. The existing managerial class, which was passive in the past under the communist target-keeping system, became more innovative in management and started thinking of out-of-the-box solutions and made themselves more than efficient Japanese, South Korean, European, and American managers. Quality of output, non-failing infrastructure, and efficiency moved China to become a factory for the world. We also found a role reversal here to make it more confusing to know who a lion is and who is a gazelle in Offshoring.

Flattener #7 Supply Chaining. Eating Sushi in Arkansas

The world has said goodbye to a situation where every part of a product is produced under one roof in one location or country and sold from there. The concept of self-reliance is no longer valid and is replaced by the least cost, reliability, and efficiency of supply chains from selected competent countries. The frequency of market demand by location in the world marketplaces determines the assembly location of final products in any country. At the same time, parts and components are produced in many countries and areas based on their patents and efficiency of production and cost factors. The final assembly destination has a series of supply warehouses around it. When an order, for example, on a website, is made, the e-commerce firm sends information about the purchase with the time required to fulfill the order to—the e-commerce seller. A computer algorithm for reduced cost and efficiency allows the message to be transmitted to the best location for the product assembly. The assembly orders all components required from different warehouses and then assembles and couriers them to the consumer. Another algorithm based on real-time supply statistics allows the warehouse to stock an optimum number of parts so that there is no loss due to excess inventory being unsold. In this situation, we have a global system of megacity operating a business where the nationality of the participant supply chain does not matter, but what matters is cost reduction and reduced time for delivery to the customer. All these activities can be synchronized using artificial intelligence, which guides the production, assembly, dispatch, and logistics using facts and algorithms, not Marxism, Socialism, or Maoism. Indirectly, it helps in world peace since war is likely to disrupt the economic activity of many nations involved because of the

supply chain disruption, which nobody wants. The supply chain resulted in a series of technological innovations to strengthen the supply chains further and created a complete set of new jobs that were not there earlier.

Sushi in Arkansas expresses the global co-existence of an interconnected intelligent mega-global system of cities.

They Were Flattening # 8 Insourcing. What Are the Guys in Funny Brown Shorts Doing?

Outsourcing is an activity in which a particular corporate function sends out to another country based on efficiency, cost, and another factor of production and services. Here, for example, an accounting firm hired to file income tax outsources his job from the USA to an Indian firm at 5 pm, and the Indian firm works on it, giving all precautions of secrecy of data, and then sends it back to the accounting.

Firm before 9 am when the firm opens its shop. There is no change in the working hours of US and Indian firms since when it is night in the US, it is a day in India. This is an example of outsourcing. Insourcing is another form of outsourcing in which a job remains within the county, but formal office space for this activity is no longer required. The position is given to a stay-at-home spouse and retired personnel who are competent to do the work at home or in shared workspaces, and they may be scattered in many states within the country.

A good example is ticketing airway travel involving receiving instructions, discussing, and finally marking, using electronic payment, ticket preparation, and email. Further, the traveler prints his boarding pass based on his education and then travels to the airport, where face recognition admits him into his aircraft. However, an imaginary corporate office exists based on a telecommunication or web connection. When One phone for an air ticket or apply on the website, one of the in-shoring households receives the call, answers, and tickets it. An algorithm that fixes who should receive the call and execute the job directs the phone call to this individual. The company no longer requires a brick motor office to function here. He can hire the activity dispersed throughout the country at a much cheaper cost. I have used another example here, but Thomas Friedman gave an example of how a courier company UPS doubled up as a computer service company for Toshiba. Imagine what happens to a physical city when we are inshore all Administration of the Government of India and all State Governments in India to the brick and motor collectorates and secretariat; these buildings transform into recreation areas for the local population. They are not required, and so also most government servants, but administrative services are performed much more efficiently and cost-effectively.

Flattener # 9 In-Forming Google, Yahoo, and MSN Web Search

According to Friedman, in-forming through web search is a form of collaboration that is a foundation of globalization and global cities. In-forming is the individual personal analog to open-sourcing, outsourcing, supply chaining, and offshoring. In-forming is the ability to build and deploy Oner supply chains, a chain of information, knowledge, and entertainment that will make One part of the global economy. In-forming is about self-collaboration, an Oner researcher, and the editor, without going to the library. It is about seeking like-minded people and communicating using social

media. It has more functions than One can imagine. Web search can also act as a personal and free detective.

Flattener # 10 the Steroid Digital, Mobile, Personal and Virtual

The tenth Flattener is a piece of digital information and its access to all through smartphones in One's pocket. The world is digitizing all information continuously and available in WWW. One can access it through Oner's smartphone even if one travels on a bullet train at 150 miles per hour. One can do all nine flatteners discussed above through the smartphone. The smartphone is One the most extensive library in the world; it is the biggest theater in the world with the choicest cinema, the enormous music concert hall in the world. Many of these digital resources are free of cost. So, the intelligent mobile phone should be part of smart global megacities.

The many study cities were global before the colonial period, like ancient cities in China, India, and many other countries. The town was international but not megacities then and has even unique traditions such as the "City of Truth for Kozhikode Kerala India," coined by travelers before the colonial era a few hundred years before. The rediscovery of the ancient cultural system of the global city is the first step in creating global megacity. With more than 100% smartphone ownership in the study area of Indo-Pacific, the world is already interconnected to megacity, but more actions are required to make it an accurate and most cost-effective global megacity leveraging opportunities in the global workplaces are scattered in the study megacity. Globally operable workflow applications are already available but not yet learned and widely used in the study area for global interconnectedness and collaborative economic development. The Study City is yet to develop a self-organizing collaborative community for international services, trade, app development, and production by designing appropriate intelligent communities. Study City is yet to practice as part of outsourcing. Study City is yet to practice and reap the benefit of offshoring foreign manufacturing and services by making factors competitive and cheaper elsewhere. Study City is yet to practice and reap the advantage of being part of global supply chains. Study City is yet to practice and reap the benefit of being part of insourcing. Study City is yet to practice and reap the advantage of being part of In-forming. Study City is yet to practice and reap the benefit of being part of personal and virtual computing.

Here Thomas Friedman's book explains how a megacity system of Indo-Pacific can become a global city system without mentioning the word megacity.

4.9 New Town Megacities in the Indo-Pacific as Charter Cities [40, 45, 46]

The megacity endowment of a country depends on the demography, with countries having large populations, such as China and India having a more significant number of megacities. In contrast, countries such as Russia, with vast geographic areas and fewer people, have fewer megacities, and Australia, with less population with a

large geographic area, does not have even one megacity. It is a fact that a megacity like Tokyo performs as a more robust economic engine none of any village and a small city, say 500,000 plus population, can accomplish. Further, vaster the land area calls for megacity creation for equitable incidence of socio-economic development benefits using more robust economic growth engines.

Since the economy of scale matters in the Indo-Pacific, the new town megacity must be studied for feasibility; for example, Shenzhen is a megacity new Town in China specializing as an electronic manufacturing hub. Since Shenzhen is functionally integrated with the financial capital of Hong Kong, its growth of a higher order is well assured with formidable export figures. These proposed new town megacities can be in strategic locations of the Indo-Pacific and can be a well-thought-out economic engine with complementary industrialization. I suggest two new town megacities; one of their feasibilities will be evaluated in the part Megacity Case Studies.

Vladivostok in the Indo-Pacific is now being connected by a new sea route as part of Indo-Russian collaboration, which can be navigated in 24 days instead of the current 60 days through gateways ports of many other megacities. Russia manufactures high-end and less costly defense equipment for India. Their S 400 system and recently tested multiple nuclear-headed hypersonic missiles make them one of the leaders in defense industries in the world. India is dependent on Russian weapons. I recommend that if there is a multi-country defense equipment manufacturing and service megacity in Vladivostok as a collaboration of Russia, India, and many Indo-Pacific countries participating can be an ideal proposition since the security environment of Indo-Pacific countries demands each country in the Indo-Pacific acquire defense equipment to fight against any aggression can be solved. The need for such a New Town megacity is further substantiated by Military spending of the world in 2021 at \$ 2.1 trillion, and the first five largest spenders published by the Stockholm Peace Research Institute were the US, China, India, UK, and Russia all of them part of Indo-Pacific. India's defense spending was \$ 76.6 billion, while the US and China were much higher, accounting for 52% of the total \$ 2.1 trillion. While in economic activities, many countries like to collaborate; in war, each country is alone and must fight their war alone, just like Ukraine fought a war alone with the Russian invasion and India and China with a massive build-up of defense forces facing each other in the cold.

And inhospitable western Himalayas. Since defense technology uses high-end education and research, we can also have an education hub specializing in STEM education in Vladivostok. This can be free.

Another possibility of Indo-Pacific a second megacity is in the strategic location of Andamans. This lowers the distance between two megacities Bangkok in Thailand and Jakarta in Indonesia, with the Indian subcontinent and many other ASEAN countries nearby. This can be a multi-functional and diverse Tourist cum Industrial and commercial megacity with an international education hub for STEM education and health tourism again accessible. This can be the gateway of India to ASEAN within 60 to 90 min by flight.

The chartered cities concept is an institutional setup for the proposed megacities. A charter city functions based on the city's charter document, which fully considers interests of all stakeholders of the proposed city, irrespective foreigners or locals, who want to invest and live in these cities and protect all their interests. It will not follow the general law based on the country's constitution. In this public law, the Central Government, State Government, and City Governments share the Governing and management functions based on what the state, central, and city functions should perform. They will have a unique schedule called state, mid, and city schemes with specific powers and responsibilities. The charter can be designed to function as a compelling global city, meeting the needs and fears of foreign and local participants. It is designed to attract international capital and institutions to cooperate with this charter and participate in global providers of products and services at the least cost. Unlike city laws under the country's constitution, this charter provides for autonomy, with less independence and limited power delegated to the city by the state. Many countries had special economic zones with a limited delegation of freedom to participants. "A charter city is a new type of special zone that can serve as an incubator for reform. In partnership with credible allies, which can be from as many countries as possible, a developing country can pursue reforms in a special zone large enough to one day accommodate a city with millions of residents originally to ten million in these cities." It is a greenfield project and not a brownfield. The formal rules in a charter city and the norms that these rules encourage can differ markedly from those prevailing elsewhere in the country. These rules can nevertheless be legitimate in the eyes of the migrants to the zone, just as the regulations in high-income countries are legitimate in the eyes of the few immigrants that manage to move from less developed countries.

Economist Paul Romer proposes founding many new charter cities in developing countries, especially South America, which supplies many migrants to the USA. This can stop or control the limited extent of immigration to the USA. Romer suggests that a developing country pass a law that sets aside a tract of land for a new charter city. A developed third-party guarantor government would administer this charter city, and citizens from the host country (and other countries) could move in and out as they please. The point of the charter cities idea is to give citizens a choice about where they want to live and to provide the basic rules and amenities required for economic growth. Ideally, by establishing a city with highly developed regulations and governance in an underdeveloped region, living and working in a charter city may provide a closer and more attractive alternative to moving far away to more developed countries.

A city charter is a unique document that, in many ways, acts as a constitution for the city adopting it. It can only be adopted, amended, or repealed by a majority vote of a city's voters. The primary advantage of a charter is that it allows greater authority for a city's governance than that provided by state law.

A charter transfers the power to adopt municipal legislation from the state legislature to the city adopting it. A municipality operating under a charter can acquire complete control over its Municipal affairs. These affairs are unaffected by the general laws passed by the state legislature on the same subject matter. This, in effect, gives the

local voters more control over their local government and the city's affairs. However, a city operating under a charter is still subject to the general laws, as passed by the state legislature, on matters that are not municipal and are of state-wide concern.

All indices of easy-to-do business are fully honored in a chartered city since it is open to reforms and the town decides on it, not the legislative assembly of the state where the city is located or the Central Government. The threshold issue is whether there is a conflict between state law and a charter city enactment. The court examines the rules and regulations laid down by the Charter to see whether it conforms to the constitution, and if not, the Charter laws are discarded.

Some rules monopolize urban services like electric generation and supply as a sole public sector domain where private enterprises are not allowed. "As a result, the citizens of less developed countries often end up paying the most for basic goods such as electricity, if they have access to it at all. The places where rules are weak and inefficient are also where job-creating investment could offer the highest returns. Nevertheless, firms build new factories, not in the parts of the world where people are most eager for formal-sector jobs but where electricity is inexpensive, people and property are safe, and the rules for doing business are straightforward, predictable, and efficient. Though better rules should be easy to replicate, experience shows that social groups at all scales, from firms to cities to nations, have great difficulty achieving the consensus required to change their rules and norms. In this setting, competition between different jurisdictions –each trying to attract new members by implementing better rules – can be a powerful source of human progress. This competition is compelling if new entrants, new start-up jurisdictions, can challenge incumbents."

Structure of a Charter City.

A charter city's governance structure could vary significantly following what is laid down in the country's constitution for the city depending on where it is established, "but all charter cities would share four common elements. The first is an undeveloped piece of land large enough to host an entire city eventually. The good target size is 1,000 square kilometers or multiple; the size of Hong Kong and Singapore is higher density than existing and more compact development with adequate public spaces. The second common element is a charter that pre-specifies the general rules that would apply there. The third element is a commitment to choose, backed by both voluntary entry and free exit for all residents, employers, and investors. The fourth is a commitment to the equal treatment of all residents under the law."

"The broad commitment to choose means that only a country that wants to create a charter city will offer the land. It also means that only people and firms who make an affirmative decision to move to the new town will live under its rules – staying if those rules are as good as those offered by competing cities. A charter or constitution should outline general principles and describe the process of establishing and enforcing a city's detailed rules and regulations. It should provide a foundation for a legal system that will let the city grow and prosper. This legal system, which a partner country might give instant enforcement credibility, will be essential for attracting foreign direct investment in long-lived urban infrastructure. Of course, a

charter should not specify a centralized economic plan. It should not contain rules for a detailed spatial plan for the city, which determines what people can do in every location. The regulations encouraging economic opportunities and vibrant city life will leave broad scope for experiments and let competition and choice determine which experiments persist. Moreover, in.

In a city where population and income per capita will increase, the rules should allow much more flexibility and change required in a less dynamic environment. Participating nations have three distinct roles: host, source, and partner. The host country provides the land. The source country supplies the people who move to the new city. The partner country helps to ensure that the charter will be respected and enforced for decades into the future. Because these roles can be played by a single nation or by several countries working together as partners, there are many potential charter city arrangements. One possibility is for one country to assume all three roles, much as China did in establishing the special economic zone where the new city of Shenzhen emerged, with the Central Government acting as a “partner” to the local authorities. India is considering such a path, using innovative governance structures and public–private partnerships to create new cities on greenfield sites. The key to going it alone is the ability of the Central Government to credibly commit to would-be residents and investors that the special rules in a new reform zone will be upheld. In Romer’s conception, three main factors exist in creating a charter city. First, there is a developing host country. The host country provides the land and designates that land as a special reform zone, subject to the foundational set of rules. Second, the developed guarantor country administers the region with a board of governors and an appointed chairperson, like the Federal Reserve System in the United States. Third, the source country will be. Where the charter city’s residents come, this may be from the host country, but they may also be many source countries.”

“In practice, some countries have been receptive to Romer’s idea. After a meeting of Romer with President Marc Ravalomanana, Madagascar considered creating two charter cities. Still, the plan was scrapped when the political leadership that supported the idea was removed from power. The government of Honduras has considered creating a charter city, though without the oversight of a third-party government. In 2011 Honduras made the necessary legal changes. Romer served as chair of a “transparency committee” but resigned in September 2012 when the Honduran Government agency responsible for the project signed agreements with international developers without the committee’s knowledge. In October 2012, the Honduran Supreme Court declared charter cities unconstitutional because the laws of Honduras would not be applicable here.”

4.10 Smart Global Megacities [47, 49]

Smart global megacities will have 100% smartphone ownership with higher broadband connectivity in every building, whether a house, factory, hospital, or airport. There shall be a bandwidth below which is not allowed to operate in a megacity.

Economic, social, political, and cultural activities and environmental resources management functions will be conducted by a strategically located system of functional IOTs connected to an ICT system. Smartphone apps articulate this general connectivity by ICT and IoT systems with voice interfaces like Alexa, Google Assistant, or Hub. Local universities will be involved in producing relevant E-Democracy and E-Governance Apps for use by inhabitants for various day-to-day activities and functions. Spatial Decision Support Systems using GIS in smartphone apps will be used extensively in E-Governance and E-Democracy. An attempt will be made to use every available network cost-effectively and efficiently. Smart communities, universities located in the megacities, and the Chamber of Commerce and Industry will be given all critical roles in the Megacity for its future.

A Smart City System comprises six fundamental building blocks: (I) intelligent people, (ii) innovative city economy, (iii) smart mobility, (iv) smart environment, (v) smart living, and (vi) innovative governance. These six building blocks are closely interlinked and contribute to the 'Smart City The system.' Some authors treat the six elements of a smart city system equally [50–55]. However, I give prominence to smart people because, without their active participation and involvement, a Smart City System would not function in the first place. A Smart City System will risk its efficient functioning without Smart People.

We define intelligent people of the global megacity as a part of a smart community of people. The sum of smart households, which promotes global/international city activities by relating and connecting local economic and cultural activities to the world, is a smart community that can interact face to face in a walkable space of a 1.5 to 2 km radius around a major activity center. Here smart households cannot be an isolated entity but an integral part of a smart local society. Local institutions such as academic and business institutions participate with the regulative government to make people smart.

5 Evolution of QUAD and the Program Region of Indo-Pacific

QUAD is originally a Latin word in English, meaning the number FOUR. In Geographic Information System, QUAD can be the Quadrilateral object; in cartography, Quadrilateral can be how four-point objects, namely capital cities, the seat of governance of four distant countries covering Indo-Pacific, are interconnected as in the map below. In architecture, QUAD can be a courtyard; in urban design, it can be a square or public realm where people meet. For scholars of international security and military sciences, it can be Quadrilateral Security Dialogue, and this book deals with the emerging regional development architecture through the prism of megacity system architecture; it is all about how life and work of the people of the Indo Pacific can be changed as a collaborative effort led by the US, Japan, Australia, and India.

In 2004, Australia, India, Japan, and the United States came together spontaneously out of compassion to manage the humanitarian assistance and disaster relief efforts in the aftermath of the 2004 Indian Ocean tsunami. They used all the appropriate capacity they had in this joint and synchronized effort for the Tsunami response mission in 2004 and successfully executed the first Quadrilateral engagement for the Indo-Pacific. It was so well executed as if these four countries were from one family of blood relatives working for a common cause of their big family of the Indo-Pacific irrespective of the fact that the society there is multi-racial and diverse politically, ecologically, economically, and culturally. This mental image retained was so satisfying to these four countries that it persisted as an idea among strategists of the four countries.

By 2006, then-Prime Minister of India, Manmohan Singh, on a state visit to Japan with his newly elected counterpart, Prime Minister Shinzo Abe, noted, in a joint statement, the “usefulness of having dialogue among India, Japan and other like-minded countries in the Asia–Pacific region on themes of mutual interest.” With the United States and Australia making up these “other like-minded countries in the Asia–Pacific,” the QUAD was born that year.

By 2007, the QUAD had two components. This was diplomatic—an informal meeting of officials from all four countries on the sidelines of the East Asia Summit in Manila or other places. The second was military—a joint exercise involving all four countries and Singapore under the aegis of the then-bilateral US-India MALABAR Exercise. Japan, Australia, and Singapore were invited as “non-permanent partners” in 2007; MALABAR was officially upgraded to a trilateral exercise in 2015 when Japan became a “permanent partner.” This military and security aspect of such collaboration is not part of this book, including development like AUKUS.

There was a setback for QUAD by 2008, and it became dormant due to domestic political compulsions. It forced the countries to take a step back from the QUAD. Prime Minister Abe—seen as the driving force behind the grouping—resigned from his position in September 2007. Prime Minister Singh faced backlash from the coalition political alliance over growing US-India ties and the QUAD. However, the QUAD was put down after Australian officials, sensitive to China’s vocal concerns over the QUAD, declared that they “would not be proposing to have a dialogue of that nature” again.

In the years since, the idea of resurrecting the QUAD has continued to linger and gain speed. Since 2008, India has deepened its ties with all three countries through various bilateral and trilateral mechanisms. The rise of China and its increasingly assertive behavior, which has threatened the critical interests of all four countries, has also given additional impetus to restart the group. On November 12, 2017, an entire decade after the informal meeting of the QUAD, the four countries announced that officials from all four countries had met to discuss “issues of common interest in the Indo-Pacific region.” Since its resurrection, the QUAD has steadily grown in its engagements.

Since 2017, the QUAD has risen steadily from the government’s low-level official level to the ministerial and leader’s level and expanded its cooperation in scope and substance. During the leader-level meeting due to the COVID-19 aftermath, the QUAD announced the creation of three working groups—on COVID-19 vaccines, climate change, and critical technologies—to underscore its evolution and utility to the Indo-Pacific region. The last summits at the country leadership level further expanded its substantive cooperation, announcing new initiatives among the existing workings groups and creating new workings groups as below.

The Indo-Pacific is a well-connected region with good infrastructure and economies like China and India, with the fastest GDP growth rate globally. The following maps give the existing and proposed connectivity of the Indo-Pacific region. These connections are toward twenty-one megacities, as shown in the map below (Figs. 34, 35, 36, 37 and 38).

The only thing happening is that the trade between India and Pakistan under political compulsion has been reduced directly but increased via Dubai port. This should be read concerning ambitious Belt and Road Initiative as shown below in Pakistan.

Despite two big armies standing eyeball estimate in the eastern Himalayas, the trade between these two countries has not stopped but increased. The details are given below. This is a manifestation of the megacity system-based economies.



Fig. 34 Major seaports and airports

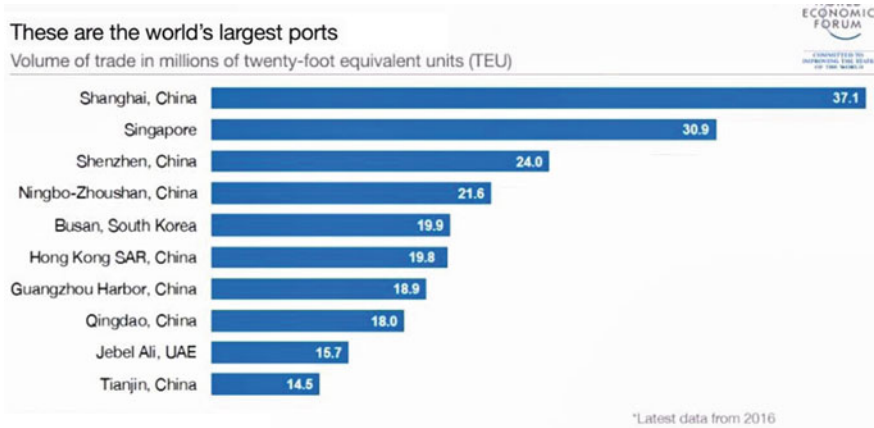


Fig. 35 Ports by importance



Fig. 36 Silk road ancient and current. Source <https://www.Onetube.com/watch?v=pUf17M3GLaM>

5.1 QUAD Working Groups

QUAD Leaders’ policies, strategies, financing, and action programs are based on the constituted working groups. A brief introduction to these workgroups below enlightens the scope of these functional groups.

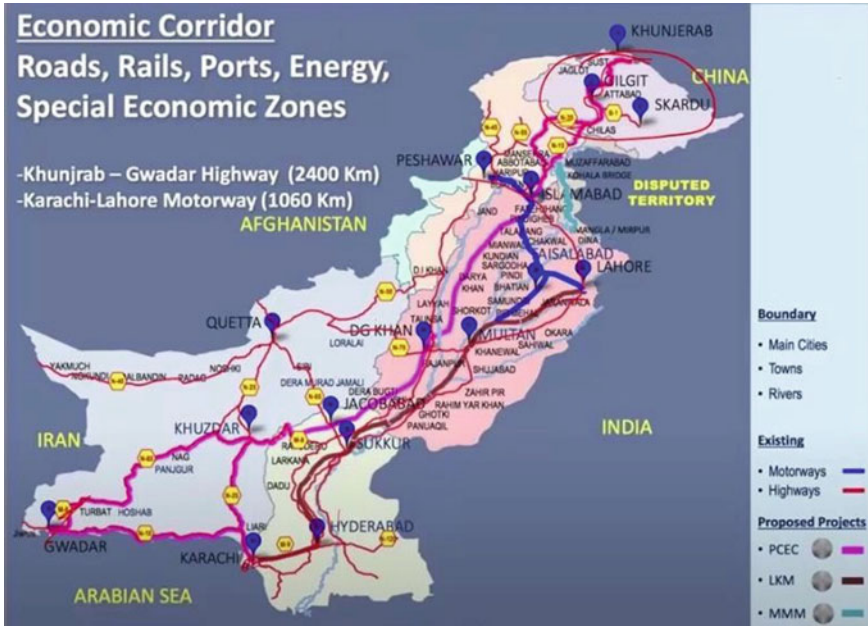


Fig. 37 Economic Corridor Pakistan. Source <https://nha.gov.pk/projects>

1. QUAD Vaccines Experts Group.

This workgroup is to fulfill the target of one billion COVID-19 vaccine doses distributed by the end of 2022 in the Indo-Pacific, with investments of \$100 million for COVID-19 vaccines, logistics expertise from Japan, and a management system focusing on last-mile connectivity from Australia and vaccine manufacture from India and vaccine patent from the USA. QUAD countries will jointly build and conduct a pandemic preparedness exercise in 2022.

The United States, through the DFC, will work with Biological E Ltd. to finance increased capacity to support Biological E’s effort to produce at least one billion doses of COVID-19 vaccines by the end of 2022 with Stringent Regulatory Authorization (SRA) of the World Health Organization (WHO) Emergency Use Listing (EUL), that includes the Johnson & Johnson vaccine.

Japan, through JICA, is in discussions to provide concessional yen loans for the Government of India to expand manufacturing for COVID-19 vaccines for export, with a priority on producing vaccines that have received authorization from WHO Emergency Use Listing (EUL) or Stringent Regulatory Authorities.

QUAD partners will ensure expanded manufacturing will be exported for the global benefit and procured through key multilateral initiatives, such as COVAX, that provide life-saving vaccines for low-income countries and countries in need.

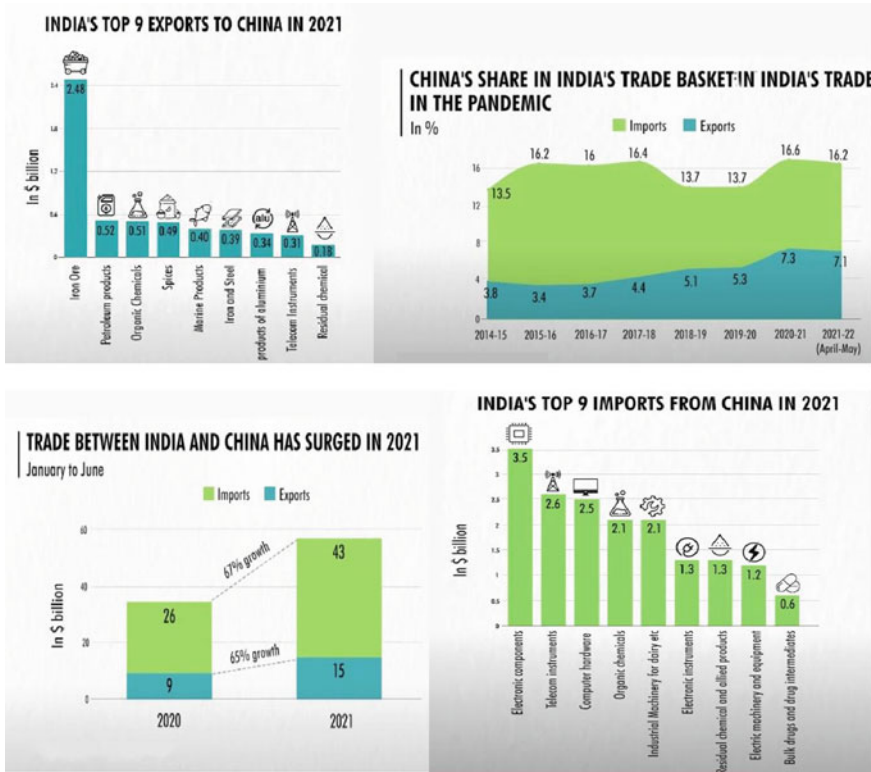


Fig. 38 India Trade to China 2021

QUAD partners will also cooperate to strengthen “last-mile” vaccination, building on existing health security and development programs, and across our governments to coordinate and improve our programs in the Indo-Pacific.

- This includes supporting countries with vaccine readiness and delivery, vaccine procurement, health workforce preparedness, responses to vaccine misinformation, community engagement, immunization capacity, and more.
- Australia will contribute US\$77 million for the provision of vaccines and “last-mile” delivery support with a focus on Southeast Asia, in addition to its existing commitment of US\$407 million for regional vaccine access and health security, which will provide full vaccine coverage to nine Pacific Island countries and Timor-Leste, and support procurement, prepare for vaccine delivery and strengthen health systems in Southeast Asia.
- Japan will assist vaccination programs in developing countries such as the purchase of vaccines and cold-chain support, including through the provision of grant aid of \$41 million and new concessional yen loans, ensuring alignment with and support of COVAX.

- The United States will leverage existing programs to boost vaccination capability further, drawing on at least \$100 million in regional efforts focused on immunization.
- The commitment of QUAD will be implemented by the launch of a senior-level QUAD Vaccine Experts Group, comprised of top scientists and officials from our governments. This group will support QUAD cooperation in the long term and use science and evidence to:
- Design and implementation plan for the QUAD COVID-19 vaccine effort; identify hurdles impeding vaccine administration in the region.
- Work with financiers and production facilities to monitor timely and sufficient. Capacity expansion will lead to broader distribution of safe and effective vaccines.
- Share governmental plans to support Indo-Pacific health security and COVID-19 response and identify practical cooperation on “last-mile” delivery for hard-to-reach communities in need.
- Strengthen and support the life-saving work of international organizations, including the WHO, COVAX, Gavi, CEPI, UNICEF, the G7, ASEAN, and governments. Furthermore, calls on other countries to do the same.
- Make additional concrete recommendations before the end of the year.

2. Climate Change Working Group.

This program envisages the formation of a Green Shipping Network. The region’s many shipping ports will establish a network dedicated to greening and decarbonizing the shipping value chain. QUAD will establish a Clean Hydrogen Partnership to strengthen and reduce costs across all elements of the clean hydrogen value chain. It includes techno development and efficiently scaling up clean hydrogen production, developing regional delivery infrastructure, and boosting demand for pure Hydrogen. It will create a Climate and Information Services Task Force on Climate change.

- Cooperation, both among QUAD leader countries and with other countries, to strengthen implementation of the Paris Agreement, including keeping a Paris-aligned temperature limit within reach.
- Working with other countries to support, strengthen, and enhance climatic actions globally.
- We are committing to advancing low-emissions technology solutions to support emissions reduction.
- Cooperation on climate mitigation, adaptation, resilience, technology, capacity-building, and climate finance.

3. Disaster-resilient Infrastructure Working Group:

Military disaster relief involving humanitarian Assistance and disaster relief in QUAD countries has evolved to considerable maturity in the Indo-Pacific in its many past operations. These defense forces have started using shared infrastructure and protocol with the Malabar exercise. Military-to-military cooperation in disaster relief was not initially a strategy for regional engagement, but with QUAD, in place, it is

changing. The central rationale is alleviating suffering, preserving human dignity, and, most importantly, saving lives.

- It is strengthening international humanitarian action, notably in the Indo-Pacific region.
- They are reducing disaster risk through the implementation of long-term strategies and investment in capabilities.
- supporting other countries to better respond to disasters through effective Humanitarian Aid/Disaster Relief; and
- supporting rapid recovery and redevelopment following disasters

4. Critical and Emerging Technology Working Group:

Since its establishment in March 2021 using virtual meetings, this working group has remained the primary mechanism for technology cooperation in the QUAD. QUAD Critical Technologies Working Group encourages cooperation on telecommunications deployment, diversification of equipment suppliers, and future telecommunications through close partnerships with private sectors and industry. It facilitates collaboration to monitor trends and opportunities related to critical and emerging technology developments, including biotechnology. Convene dialogues on essential technology supply. Partner countries remain committed to developing necessary and emerging technology that yields tangible benefits for society, developed through a multi-stakeholder approach that is adaptive, dynamic, and aligns with universal values, including respect for freedom of expression and privacy.

- Develop a statement of principles on technology design, development, and use.
- Facilitate coordination on technology standards development, including between our national technology standards bodies and working with a broad range of partners.
- Encourage cooperation on telecommunications deployment, diversification of equipment suppliers, and future telecommunications, including through close collaboration with private sectors and industry.
- Facilitate cooperation to monitor trends and opportunities related to critical and emerging technology developments, including biotechnology.
- Convene dialogues on critical technology supply chains.

The QUAD members support technological design, development, governance, and using approaches that promote shared values, including individuals' autonomy, agency, and dignity. The statement highlighted that technology design, development, governance, and use should be an equitable and inclusive process that neither involves nor results in unfair discriminatory action. Misuse of Technology or abuse for malicious activities such as authoritarian surveillance and oppression, for terrorist purposes, or disseminating disinformation shall be excluded and are committed to building trust, integrity, and resilience.

According to the official release, QUAD members acknowledge that technology ecosystems should be built upon trust, integrity, and resilience to foster innovation and

highlight the need to support openness and interoperability to enable collaboration and to welcome innovators who are both diverse in their gender, race, and ethnicity, as well as in the size, structure, and age of their organizations.

QUAD members expect technology suppliers, vendors, and distributors to produce and maintain secure systems and to be trustworthy, transparent, and accountable in their practices. In contrast, technology developers should build safety and security-by-design approaches so that robust safety and security practices are a part of the technology development process. The statement highlighted that Illicit transfer or theft of technology is a common challenge that undermines the foundation of global technological development and should be addressed.

The QUAD supports resilient, diverse, and secure technology supply chains—for hardware, software, and services—that are vital to the shared national interests of the member states. Close cooperation on supply chains with allies and partners who share the combined values of the QUAD members will enhance our security and prosperity and strengthen allies’ capacity to respond to international disasters and emergencies. The members also encouraged healthy competition and international collaboration to advance the frontier of science and technology.

5. QUAD principles of the fair and open marketplace are a cornerstone of innovation and inclusive prosperity.

The QUAD principles suggested that free and fair market competition in which the best technical solutions succeed, including with the help of transparently awarded state incentives, would be prioritized, and highlighted the following points:

The development of competitive technology ecosystems that welcome new market entrants, including start-ups, and enhance innovation, resilience, and sustainability would be encouraged. The importance of industry-led, consensus-based, multi-stakeholder approaches to international standards development that foster interoperability, compatibility, and inclusiveness would be affirmed. The QUAD would remain committed to reducing barriers to data and knowledge sharing for research projects and more significant innovation while protecting research security. The partners would also intensify efforts to facilitate the exchange of researchers and the movement of highly skilled personnel to enhance science and technology collaboration. Remain committed to developing shared research and development agendas, including joint projects and joint capacity-building where possible, that align with foundational scientific principles, further our shared values, and promote workforce diversity and education. “Together, we will continue to keep pace with changes in the global economy and innovation processes by monitoring future trends and harnessing the opportunities to advance technologies to address many of our shared objectives: security and resilience, sustainability, economic inclusion, and health and wellbeing,” stated the White House. The White House also highlighted the commitments to foster technology development that accelerates economic progress and serves the needs of all citizens and welcomed all nations to join the QUAD members in pursuit of a shared vision for technologies guided by these principles.

6. QUAD Statement of Principles on Technology Design, Development, Governance, and Use:

This Statement of Principles is a collaborative effort to firm that any technological progress in the QUAD countries is shaped by their shared democratic values and respect for universal human rights. Technology should make the lives of its citizens more secure, prosperous, and rewarding. The Observer Research Foundation, India, the National Graduate Institute for Policy Studies, Japan, and the United States Centre for a New American Security, US, have commissioned papers on the region's critical issues. These papers offer analysis and recommendations on shared challenges facing Indo-Pacific partners in the cyber and technology environment.

7. Infrastructure Working Group:

Building on the G7's announcement of Build Back Better World (B3W)—an infrastructure partnership focused on digital connectivity, climate, health and health security, and gender equality infrastructure—the QUAD will rally expertise, capacity, and inference to strengthen ongoing infrastructure initiatives in the region and identify new opportunities to meet the needs there.

The QUAD will launch the QUAD Infrastructure Coordination Group: Building on existing leadership from QUAD partners on high-standards infrastructure, a senior QUAD infrastructure coordination group will meet regularly to share assessments of regional infrastructure needs and coordinate respective approaches to deliver transparent, high-standards infrastructure. The group will also coordinate technical assistance and capacity-building efforts, including with regional partners, to ensure these efforts are mutually reinforcing and complementary in meeting the significant infrastructure demand in the Indo-Pacific.

Lead on High-Standards Infrastructure: QUAD partners are leaders in building quality infrastructure in the Indo-Pacific region. These complementary approaches leverage both public and private resources to achieve maximum impact. Since 2015, QUAD partners have provided more than \$48 billion in official enhancements for infrastructure in the region. This represents thousands of projects, including capacity-building, across over thirty countries supporting rural development, health infrastructure, water supply and sanitation, renewable power generation (e.g., wind, solar, hydro), telecommunications, road transportation, and more. Our infrastructure partnership will amplify these contributions and further catalyze private sector investment in the region.

8. Establish Technical Standards Contact Groups:

The QUAD will establish contact groups on Advanced Communications and Artificial Intelligence, focusing on standards-development activities and foundational pre-standardization research. Technical Standards Contact Groups in Advanced Communication and Artificial Intelligence, Technical standards, 5G diversification, deployment, horizon-scanning, and technology supply chains for critical and emerging technologies will be addressed.

9. Publish a QUAD Statement of Principles Consult on Norms and Guidelines:

QUAD will also consult on norms, guidelines, principles, and rules for ensuring the long-term sustainability of the outer space environment. After months of collaboration, QUAD will launch a statement of principles on technology design, development, governance, and use that QUAD hopes will guide the region and the world toward responsible, open, high-standards innovation. A statement of principles on technology design, development, governance, and use regarding lofty standards of innovation.

10. Support 5G Deployment and Diversification:

Supporting the critical role of QUAD governments in fostering and promoting a diverse, resilient, and secure telecommunications ecosystem, the QUAD has launched a Track 1.5 industry dialogue on Open RAN deployment and adoption, coordinated by the Open RAN Policy Coalition. QUAD partners will jointly facilitate enabling environments for 5G diversification, including efforts related to testing and test facilities.

11. Monitor Biotechnology Scanning:

The QUAD will monitor trends in critical and emerging technologies, starting with advanced biotechnologies, including synthetic biology, genome sequencing, and biomanufacturing. In the process, they will identify related opportunities for cooperation.

12. Semiconductor Supply Chain Initiative:

QUAD partners will launch a joint initiative to map capacity, identify vulnerabilities, and bolster supply chain security for semiconductors and their vital components. This initiative will help ensure QUAD partners support a diverse and competitive market that produces the secure critical technologies essential for AI economies globally—the launch of a Semiconductor.

Supply Chain Initiative Launch a Semiconductor Supply Chain Initiative: QUAD partners will launch a joint initiative to map capacity, identify vulnerabilities, and bolster supply chain security for semiconductors and their vital components. This initiative will help ensure QUAD partners support a diverse, competitive market that produces the secure critical technologies essential for global digital economies.

13. Space Cooperation Working Group:

QUAD will also begin space cooperation for the first time. The four countries will exchange satellite data on monitoring and adapting to climate change and disaster preparedness. Capacity-building in space-related domains in other Indo-Pacific countries will be facilitated and encouraged to drive continuous improvement in areas including the adoption and implementation of shared cyber standards, development of secure software, building workforce and talent, and promoting the scalability and cybersecurity of safe and trustworthy digital infrastructure. QUAD countries are among the world's scientific leaders, including in space.

The QUAD will: Share Satellite Data to Protect the Earth and its Waters: Our four countries will start discussions to exchange Earth observation satellite data and analysis on climate change risks and the sustainable use of oceans and marine resources. Sharing this data will help QUAD countries to better adapt to climate change and to build capacity in other Indo-Pacific states that are at grave climate risk in coordination with the QUAD Climate Working Group. Enable Capacity-Building for Sustainable Development: The QUAD countries will also enable capacity-building in space-related domains in other Indo-Pacific countries to manage risks and challenges. The QUAD countries will work together to support, strengthen, and enhance space applications and technologies of mutual interest.

14. Launch a QUAD Senior Cyber Group:

Leader-level experts will meet regularly to advance work between government and industry on driving continuous improvements, including adopting and implementing shared cyber standards; developing secure software; building workforce and talent; and promoting the scalability and cybersecurity of safe and trustworthy digital infrastructure.

15. People-to-People Exchange and Education:

Today’s students will be tomorrow’s leaders, innovators, and pioneers. To build ties among the next generation of scientists and technologists, QUAD partners announced the QUAD Fellowship: a first-of-its-kind scholarship program operated and administered by a philanthropic initiative and in consultation with a non-governmental task force comprised of leaders from each QUAD country. This program will bring together exceptional American, Japanese, Australian, and Indian master’s and doctoral students in science, technology, engineering, and mathematics to study in the United States. This new fellowship will develop a network of science and technology experts committed to advancing innovation and collaboration in the private, public, and academic sectors, in their nations and among QUAD countries. The program will build a foundational understanding among QUAD Scholars of one another’s societies and cultures through cohort-wide trips to each QUAD country and robust programming with each country to scientists, technologists, and politicians.

The QUAD will: Launch the QUAD Fellowship: The Fellowship will sponsor one hundred students per year—25 from each QUAD country—to pursue master’s and doctoral degrees at leading STEM graduate universities in the United States. It will serve as one of the world’s teaching graduate fellowships. Still, uniquely, the QUAD Fellowship will focus on STEM and unite the top minds of Australia, India, Japan, and the United States. Schmidt Futures, a philanthropic initiative, will operate and administer the fellowship program in consultation with a non-governmental task force comprising academic, foreign policy, and private sector leaders from each QUAD country. Founding sponsors of the fellowship program include Accenture Blackstone, Boeing, Google, Mastercard, and Western Digital, and the program welcomes additional sponsors interested in supporting the Fellowship.

This growing cooperation between the QUAD countries presents three significant pieces of misinformation, namely the notion that the QUAD is a “do-nothing

talk shop,” “a clique of selected countries, or a new cold war defense coalition against China for” for example, the new AUKUS security agreement between the United States, Australia, and the UK and “lack of utility” which undoubtedly is a misrepresentation in light of the above 15 initiatives.

The QUAD has quickly become a coalition collaborating across security areas such as AUKUS, non-security regions, and places that may overlap across both domains (such as critical technologies).

The QUAD’s growth and evolution have been driven by growing and shared concerns among the four countries on China’s rising assertiveness, territorial expansions, and the actions it has taken to undermine the core interests of all four members of the QUAD. However, the QUAD is not an organization against China if the Chinese system of megacity is still a producer and supplier of Industrial goods on which the world still depends. The Chinese megacity system is also part of the Indo-Pacific megacity system. QUAD intends to address the key challenges facing the Indo-Pacific region, which is not China, and provide ways and means to countries willing to collaborate. The implicit goal of QUAD is to highlight a vision shared by these four countries about a rules-based order and how it may serve the region’s interests.

There were country policies for Indo-Pacific by the four QUAD countries: Australia, India, the US, and Japan. Since the commitments of these countries in their summit override all their policies based on consensus, I have not spared to point out the thinking within each country. There are many documents available on that. As a sample, I present one of four countries, namely Japan, diagrammatically below (Fig. 39).

5.2 The First QUAD Summit on March 12, 2021 [56]

President of the USA Joseph R. Biden, Prime Minister of India Narendra Modi, Prime Minister of Australia Scott Morrison, and Prime Minister of Japan Yoshihide Suga participated in the first Leaders’ Summit of the Quadrilateral Framework, held on March 12, 2021. They discussed regional and global issues of shared interest and exchanged views on practical areas of cooperation toward maintaining a free, open, and inclusive Indo-Pacific region. They discussed contemporary challenges such as resilient supply chains, emerging and critical technologies, maritime security, and climate change leading to the discussions on ongoing efforts to combat the COVID-19 pandemic. They explored opportunities for collaboration in ensuring safe, equitable, and affordable vaccines in the Indo-Pacific region.

1. They reaffirmed their joint commitment to Quadrilateral cooperation between Australia, India, Japan, and the United States. They shared a vision for the free and open Indo-Pacific: inclusive, healthy, anchored by democratic values, and unconstrained by coercion. Recalling their successful joint efforts toward international tragedy, the Tsunami of 2004, they renewed their commitment to fighting jointly against global devastation wrought by COVID-19, the threat of climate

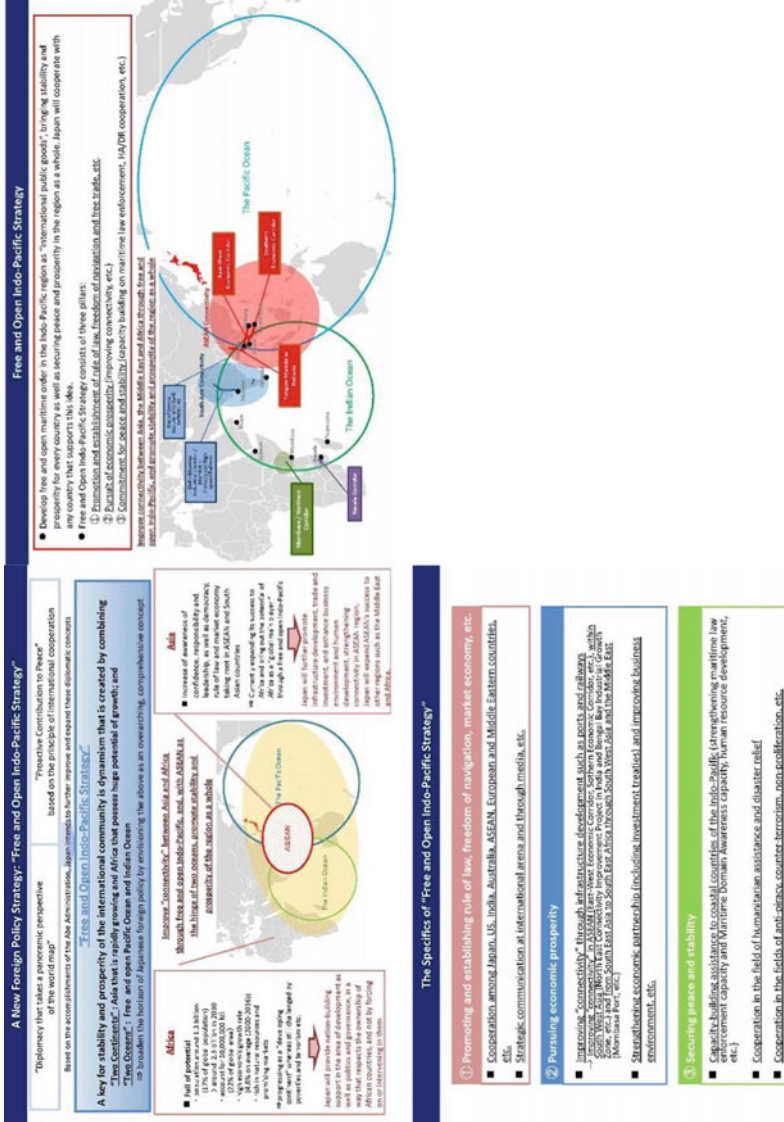


Fig. 39 Free and Open Indo-Pacific of Japanese Vision. *Source* The Government of Japan (November 2019), Toward Free and Open Indo-Pacific Sailing on Indo-Pacific Ocean Finding Opportunity for Prosperity, Tokyo

- change, as well security challenges facing the region. On this historic occasion of March 12, 2021, the first-ever leader-level summit of the QUAD, they jointly pledged to strengthen their cooperation on the defining challenges of our time.
2. Together, they committed to promoting a free, open, rules-based order rooted in international law to advance security and prosperity and counter threats to Indo-Pacific and beyond. They supported the rule of law, freedom of navigation and overflight, and peaceful resolution of disputes, democratic values, and territorial integrity. They committed to working together and with a range of partners. They reaffirmed their dedicated support for ASEAN's unity and centrality and the ASEAN Outlook on the Indo-Pacific. Full of potential, the QUAD looks forward to the future; it seeks to uphold peace and prosperity and strengthen democratic resilience based on universal values.
 3. Their common goals required them to reckon with the most urgent global challenges. They pledged to respond to the economic and health impacts of COVID-19, combat climate change, and address shared challenges, including in cyberspace, critical technologies, counterterrorism, quality infrastructure investment, humanitarian assistance, disaster relief, and maritime domains.
 4. Building on the progress these four countries have achieved in health security, they will join forces to expand safe, affordable, and effective vaccine production and equitable access to speed economic recovery and benefit global health. With a steadfast commitment to the health and safety of their people, they also recognize that none of them can be safe if the pandemic continues to spread. They will, therefore, collaborate to strengthen equitable vaccine access for the Indo-Pacific, with close coordination with multilateral organizations, including the World Health Organization and COVAX. They are united in recognizing that climate change is a global priority and will work to strengthen the climate actions of all nations, including keeping a Paris-aligned temperature limit within reach. They will begin cooperation on the critical technologies of the future to ensure that innovation is consistent with a free, open, inclusive, and resilient Indo-Pacific. They will continue to prioritize the role of international law in the maritime domain, mainly as reflected in the United Nations Convention on the Law of the Sea (UNCLOS) and facilitate collaboration, including in maritime security, to meet challenges to the rules-based maritime order in the East and South China Seas. They reaffirmed their commitment to the complete denuclearization of North Korea following United Nations Security Council resolutions and confirmed the necessity of immediate answers to Japanese abductees. As long-standing supporters of Myanmar and its people, they emphasized the urgent need to restore democracy and the priority of strengthening democratic resilience.
 5. They will redouble their commitment to QUAD engagement to advance these goals and others. They will combine their nations' medical, scientific, financing, manufacturing and delivery, and development capabilities and establish a vaccine expert working group to implement their path-breaking commitment to safe and effective vaccine distribution; they will launch a critical and emerging technology working group to facilitate cooperation on international standards and innovative technologies of the future; and they will establish a climate working group to

strengthen climate actions globally on mitigation, adaptation, resilience, technology, capacity-building, and climate finance. Their experts and senior officials will continue to meet regularly; their foreign ministers will converse often and meet at least once a year. At the leader level, they will hold an in-person summit by the end of 2021. The ambition of these engagements is fit to the moment; they are committed to leveraging their partnership to help the world's most dynamic region respond to the historic crisis so that it may be free, open, accessible, diverse, and thriving Indo-Pacific they all seek.

5.3 The Second QUAD Summit on September 24, 2021 [57]

The leaders of Australia, India, Japan, and the United States convened in person as “the QUAD” for the first time. On this important event, they recommitted to their partnership and to a region that is a bedrock of their shared security and prosperity—a free and open Indo-Pacific, which is also.

Inclusive and resilient. Just six months have passed since their last meeting. Since March, the COVID-19 pandemic has caused continued global suffering; the climate crisis has accelerated; and regional security has become ever more complex, assessing all our countries individually and together. This cooperation, however, remains unflinching.

The occasion of the QUAD Summit is an opportunity to refocus themselves and the world on the Indo-Pacific and on their vision for what they hope to achieve. Together, they recommend promoting the free, open, rules-based order rooted in international law and undaunted by coercion to bolster security and prosperity in the Indo-Pacific and beyond. They stand for the rule of law, freedom of navigation and overflight, peaceful resolution of disputes, democratic values, and territorial integrity of states. They commit to working together and with a range of partners. They reaffirm their dedicated support for ASEAN's unity and centrality and ASEAN's Outlook on the Indo-Pacific, and they underscore their dedication to working with ASEAN and its member states—the heart of the Indo-Pacific region—in practical and inclusive ways. They also welcomed the September 2021 EU Strategy for Cooperation in the Indo-Pacific. Since their first meeting, they have tackled the world's most pressing challenges: the COVID-19 pandemic, the climate crisis, and critical and emerging technologies.

Their partnership on COVID-19 response and relief marked a historic new focus for the QUAD. They launched the QUAD Vaccine Experts Group, comprised of top experts from their respective governments, charged with building strong ties and better aligning their plans to support Indo-Pacific health security and COVID-19 response. In doing so, they shared assessments of the state of the pandemic. They aligned their efforts to combat it, reinforced shared diplomatic principles for mitigating COVID-19 in the region, and actively improved coordination of our efforts to support safe, effective, quality-assured vaccine production and equitable access in close collaborations with multilateral efforts, including the COVAX Facility. In

addition to doses financed through COVAX, Australia, India, Japan, and the United States have pledged to donate more than 1.2 billion safe and effective COVID-19 vaccines globally. Moreover, to date, they have delivered seventy-nine million safe, effective, and quality-assured vaccine doses to countries in the Indo-Pacific as part of those commitments. Thanks to the QUAD Vaccine Partnership's financing of increased manufacturing capacity at Biological E LTD, additional production in India will come online later this year. In line with our March announcement and recognizing the continuing global supply gap, they will ensure this expanded manufacturing is exported to the Indo-Pacific and the world, and they will coordinate with vital multilateral initiatives, such as the COVAX Facility, to procure proven safe, effective, and quality-assured COVID-19 vaccines for low- and middle-income countries. We also recognize the importance of open and secure supply chains for vaccine production.

Despite months of pandemic hardship throughout the region and world, they have accomplished much. The QUAD leaders welcome Biological E LTD's production, including through their QUAD investments, of at least one billion safe and effective COVID-19 vaccines by the end of 2022. Today, they are proud to announce an initial step toward that supply that will immediately help the Indo-Pacific and the world to end the pandemic. The QUAD also welcomes India's announcement to resume exports of safe and effective COVID-19 vaccines, including COVAX, beginning in October 2021. Japan will continue to help regional partners purchase vaccines through a \$3.3 billion of COVID-19 Crisis Response Emergency Support Loan. Australia will deliver \$212 million in grant aid to purchase vaccines for Southeast Asia and the Pacific. In addition, Australia will allocate \$219 million to support last-mile vaccine rollouts and lead in coordinating QUAD's last-mile delivery efforts in those regions.

They will also strengthen their Science and Technology (S&T) cooperation in the areas of clinical trials and genomic surveillance so that they can accelerate their efforts to end this pandemic and build better health security. They are committed to aligning around shared global targets to help vaccinate the world, save lives now, and build back better by strengthening international health security financing and political leadership. Their countries will also conduct a joint pandemic preparedness tabletop or exercise in 2022.

They had joined forces to tackle the climate crisis, which must be addressed with the urgency it demands. QUAD countries will work together to keep the Paris-aligned temperature limits within reach and will pursue efforts to limit it to 1.5 °C above pre-industrial levels. To this end, QUAD countries intend to update or communicate ambitious NDCs by COP26 and welcome those who have already done so. QUAD countries will also coordinate their diplomacy to raise global ambition, including reaching out to key stakeholders in the Indo-Pacific region.

Their work is organized across three thematic areas: climate ambition, clean energy innovation and deployment, and climate adaptation, resilience, and preparedness, with the intent to pursue enhanced actions during the 2020s, contributing to the aim of achieving global net-zero emissions preferably by 2050, and considering

national circumstances. They are pursuing nationally appropriate sectoral decarbonization efforts, including those aimed at decarbonizing shipping and port operations and deploying clean hydrogen technology. They will cooperate to establish responsible and resilient clean energy supply chains and will strengthen the Coalition for Disaster Resilient Infrastructure and climate information systems. QUAD countries will work together for successful outcomes at COP26 and G20 that uphold the climate ambition and innovation this moment requires.

They established cooperation on critical and emerging technologies to ensure that their shared values and respect for universal human rights shape how technology is designed, developed, governed, and used. In partnership with the industry, they are advancing the deployment of secure, open, and transparent 5G and beyond-5G networks and working with various partners to foster innovation and promote trustworthy vendors and approaches such as OpenVPN. Acknowledging the role of governments in fostering an enabling environment for 5G diversification, they will work together to facilitate public–private cooperation and demonstrate in 2022 the scalability and cybersecurity of open, standards-based technology. Concerning the development of technical standards, they will establish sector-specific contact groups to promote an open, inclusive, private sector-led, multi-stakeholder, and consensus-based approach.

They will also coordinate and cooperate in multilateral standardization organizations such as the International Telecommunication Union. They are mapping the supply chain of critical technologies and materials, including semiconductors, and affirm their positive commitment to resilient, diverse, and secure supply chains of essential technologies, recognizing the importance of government support measures and policies that are transparent and market-oriented.

They are monitoring trends in the critical and emerging technologies of the future, beginning with biotechnology and identifying related opportunities for cooperation. They are also launching QUAD Principles on Technology Design, Development, Governance, and Use that they hope will guide the region and the world toward responsible, open, high-standards innovation. In the future, they will deepen their cooperation in these critical areas and broaden it to new ones.

Building upon each of their regional infrastructure efforts, separately and together, they are launching a new QUAD infrastructure partnership. As QUAD, they will meet regularly to coordinate their efforts, map the region’s infrastructure needs, and coordinate regional needs and opportunities. They will cooperate in providing technical assistance and empowering regional partners with evaluative tools will promote sustainable infrastructure development. They support the G7.

Infrastructure efforts and look forward to cooperating with like-minded partners, including the EU.

They reconfirmed the G20 Quality Infrastructure Investment Principles and will re-energize their efforts to provide high-standard infrastructure in the Indo-Pacific. They reaffirmed their interest in continuing their engagement with the Blue Dot Network. They emphasized the importance of supporting open, fair, and transparent lending practices aligned with international rules and standards for significant

creditor countries, including debt sustainability and accountability. They call on all creditors to adhere to these rules and standards.

In September 2021, they began new cyberspace cooperation and pledged to combat cyber threats, promote resilience, and secure their critical infrastructure. In space, they will identify new collaboration opportunities and share satellite data for peaceful purposes such as monitoring climate change, disaster response and preparedness, sustainable uses of oceans and marine resources, and responding to challenges in shared domains. They will also consult on rules, norms, guidelines, and principles for ensuring the sustainable use of outer space.

They are proud to begin a new educational and people-to-people cooperation chapter as they inaugurate the QUAD Fellowship. Stewarded by Schmidt Futures, a philanthropic initiative, and with generous support from Accenture, Blackstone, Boeing, Google, Mastercard, and Western Digital, this pilot fellowship program will provide one hundred graduate fellowships to leading science, technology, engineering, and mathematics graduate students across our four countries. Through the QUAD Fellowship, the next generation of STEM talent will be prepared to lead the QUAD and other like-minded partners toward the innovations that will shape their shared future.

In South Asia, they will closely coordinate their diplomatic, economic, and human rights policies toward Afghanistan and will deepen their counterterrorism and humanitarian cooperation in the months ahead following UNSCR 2593. They reaffirmed that Afghan territory should not be used to threaten or attack any country or shelter or train terrorists, plan or finance terrorist acts. They reiterated the importance of combating terrorism in Afghanistan. They denounced terrorist proxies and emphasized the importance of denying any logistical, financial, or military support to terrorist groups that could be used to launch or plan terror attacks, including cross-border attacks. They support Afghan nationals and call on the Taliban to provide safe passage to anyone wishing to leave Afghanistan and ensure that all Afghans' human rights, including women, children, and minorities, are respected.

They also recognize that their shared futures will be written in the Indo-Pacific, and they will redouble their efforts to ensure that the QUAD is a force for regional peace, stability, security, and prosperity. Toward that end, they will continue to champion adherence to international law, mainly as reflected in the UN Convention on the Law of the Sea (UNCLOS), to meet challenges to the maritime rules-based order, including in the East and South China Seas.

They affirm their support to small island states, especially those in the Pacific, to enhance their economic and environmental resilience. They will continue their assistance with Pacific Island countries on responses to the health and economic impacts of COVID-19 and on quality, sustainable infrastructure, as well as a partner to mitigate and adapt to the effects of climate change, which poses severe challenges for the Pacific.

They reaffirmed their commitment to the complete denuclearization of North Korea under United Nations Security Council resolutions and confirmed the necessity of immediate solutions for Japanese abductees. They urged North Korea to abide by its UN obligations and refrain from Provocations. They also call on North

Korea to engage in substantive dialogue. They are committed to building democratic resilience in the Indo-Pacific and beyond. They continue to call for ending violence in Myanmar, releasing all political detainees, including foreigners, engaging in constructive dialogue, and the early restoration of democracy. They further call for the urgent implementation of the ASEAN Five-Point Consensus. They will deepen their cooperation in multilateral institutions, including the United Nations, where reinforcing their shared priorities enhances the resilience of the multilateral system itself. Individually and together, they will respond to the challenges of the present time, ensuring that the region remains inclusive, open, and governed by universal rules and norms.

They will continue to build habits of cooperation; their leaders and foreign ministers will meet annually, and their senior officials will meet regularly. Their working groups will continue their steady tempo to produce the cooperation necessary to build a more substantial region.

At a time that tests us all, their commitment to realizing a free and open Indo-Pacific is firm, and their vision for this partnership remains ambitious and far-reaching. With steadfast cooperation, they will rise to meet this moment together.

5.4 The Third QUAD Summit on March 3, 2022 [58]

On March 3, commencing at 11:00 p.m. for approximately 70 min, Mr. Kishida Fumio, Prime Minister of Japan, with the Hon Scott Morrison, MP, Prime Minister of the Commonwealth of Australia, H.E. Mr. Narendra Modi, Prime Minister of India, and The Honorable Joseph R. Biden, Jr. President of the United States of America, held a video conference. This conference was called for and hosted by the US, and after the conference, Joint Call Readout was released. The overview of the meeting is as follows.

The QUAD leaders discussed the ongoing conflict and humanitarian crisis in Ukraine. They assessed its broader implications and that it is critical to promote further efforts toward realizing a “Free and Open Indo-Pacific.” They reaffirmed their dedication to the QUAD as a mechanism to promote regional stability and prosperity.

Prime Minister Kishida stated that the aggression by Russia this time is an attempt to change the status quo by force unilaterally, shakes the foundation of the international order, and strongly condemned Russia and that Japan has been promptly implementing harsh measures, aligning closely with the international community including G7. Prime Minister Kishida stated that he had recently conveyed to Ukrainian President Zelensky his intention to provide \$100 million in emergency humanitarian assistance to the Ukrainian people, who are facing a national crisis, in addition to the loan of not less than \$100 million, and that he had expressed his willingness to accept displaced persons.

They agreed to stand up new humanitarian assistance and disaster relief mechanism which will enable the QUAD to meet future humanitarian challenges in the

Indo-Pacific and provide a channel for communication as they each address and respond to the crisis in Ukraine.

The four leaders concurred that toward the realization of a “Free and Open Indo-Pacific,” the four countries will steadily advance various practical cooperation that they have been promoting in such fields as health, security, and COVID-19 response measures including vaccine-related support, infrastructure, climate change, and critical and emerging technologies. They also concurred on the importance of continuing to contribute to the region as the QUAD positively and concurred to stand up a new humanitarian assistance and disaster relief mechanism.

The four leaders concurred to hold the next QUAD Summit Meeting in Tokyo in the coming months and confirmed that the four countries would work closely together for its success.

5.5 The Fourth QUAD Summit is on May 24, 2022, in Tokyo [59–61]

The leaders of the QUAD nations—Australia, India, Japan, and the United States—met on May 24, 2022, in Tokyo for the fourth time and the second time in person.

1. The Indo-Pacific Partnership for Maritime Domain Awareness

In close consultation with regional partners, the Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA) will offer a near-real-time, integrated, and cost-effective maritime domain awareness picture. This initiative will transform the ability of partners in the Pacific Islands, Southeast Asia, and the Indian Ocean region to monitor the waters on their shores fully and, in turn, to uphold a free and open Indo-Pacific. Through investment in IPMDA over five years, the partnership will innovate upon existing maritime domain awareness efforts, rapidly bringing emerging technologies to bear for the greater good of the Indo-Pacific community. Moreover, it will integrate three critical regions—the Pacific Islands, Southeast Asia, and the Indian Ocean region—into the Indo-Pacific.

2. The QUAD Fellowship

QUAD leaders are proud to open applications for the QUAD Fellowship, which will sponsor one hundred American, Australian, Indian, and Japanese students to study in the United States each year for graduate degrees in science, technology, engineering, and mathematics (STEM) fields starting from 2023.

3. The QUAD Vaccine Partnership and Global Health Security

The United States will fund COVID-19 boosters and pediatric doses to countries of greatest need, including in the Indo-Pacific. The Biological E, Ltd facility in India will continue using expanded vaccine-manufacturing capacity as part of the QUAD Vaccine Partnership to support building sustainable manufacturing capacity, including booster shots, which will yield long-term benefits in the fight against

COVID-19 and future pandemics. The Japan Bank for International Cooperation (JBIC) and EXIM India decided to support a \$100 million facility to bolster the Indian healthcare sector, including global capacity for COVID-19 countermeasures.

4. Climate

The QUAD will broaden and elevate to combat climate change by inaugurating two ministerial initiatives in the coming months. US Secretary of Transportation Pete Buttigieg plans to convene QUAD Transportation Ministers and relevant stakeholders to accelerate the work of the Shipping Task Force, including progress toward developing Green Shipping Corridors among QUAD countries.

US Secretary of Energy Jennifer Granholm plans to meet with QUAD Energy Ministers to catalyze QUAD's efforts to deploy clean hydrogen, minimize methane emissions, and develop a 10-Year Clean Energy Supply Chain Plan. The QUAD will cooperate on disaster risk reduction for extreme weather events, including through the Coalition for Disaster Resilient Infrastructure (CDRI), building on the QUAD's joint session on strengthening Indo-Pacific infrastructure and communities at the International CDRI conference. The QUAD Climate and Information Service Task Force, dedicated to integrating and facilitating climate information services to the broader Indo-Pacific, will convene other Indo-Pacific countries at the September Asia-Pacific Ministerial Conference on Disaster Risk Reduction in Brisbane to share best practices and gauge user needs. The QUAD will advance the development of clean hydrogen and clean ammonia fuels and launch a series of roundtables on mitigating methane emissions across our liquified natural gas (LNG) sectors. The QUAD will also cooperate to enhance capacity in the broader Indo-Pacific region to participate in high-integrity carbon markets.

5. Critical and Emerging Technologies

The QUAD four countries are committed to responsible innovation in critical and emerging technologies. Since launching the Critical and Emerging Technologies Working Group at the first-ever leader-level summit of the QUAD in March 2021, QUAD partners have mapped collective capacity and vulnerabilities in global semiconductor supply chains and launched the Common Statement of Principles on Critical Technology Supply Chains, which will provide a cooperative foundation for enhancing supply chain resilience in the region. At the same time, QUAD partners are exploring ways to collaborate on deploying open and secure telecommunications technologies in the region, working with the industry through Open RAN Track 1.5 dialogues.

Through a new Memorandum of Cooperation on 5G Supplier Diversification and Open RAN, QUAD will cooperate on technical exchanges and testbed activity to advance interoperability and telecommunications cybersecurity.

The QUAD has advanced technical standards of cooperation through the International.

Telecommunication Union's Telecommunication Standardization Sector will redouble its efforts through the new International Standards Cooperation Network, a mechanism for like-minded allies and partners to share information on technical

standards activities and to increase situational awareness, coordination, and influence in international critical and emerging technologies standards.

To unlock opportunities in critical and emerging technologies through more robust engagement with the private sector, QUAD will convene industry partners to discuss business and investment issues. A QUAD Investors Network, an independent consortium of investors that seeks to advance access to capital for critical and emerging technologies within and across QUAD, is being launched today.

6. Cybersecurity

The QUAD Cybersecurity Partnership seeks to build resilience across the four QUAD countries in response to cybersecurity vulnerabilities and cyber threats. Its focus areas are critical-infrastructure protection, led by Australia; supply chain stability and security, led by India; workforce development and talent, led by Japan; and software security standards, led by the United States. Its work is guided by new joint cyber principles to improve resilience in a rapidly changing threat environment. These principles aim to prevent cyber incidents, prepare national and international capabilities for potential cyber incidents, and respond quickly and effectively to a cyber incident when or should one occur. The QUAD will strengthen information sharing among QUAD country Computer Emergency Response Teams (CERT), including exchanges on lessons learned and best practices. QUAD will improve software and Managed Service Provider (MSP) security by coordinating cybersecurity standards for QUAD governments' software procurement. QUAD partners will launch a Cybersecurity Day campaign, open to countries across the Indo-Pacific and beyond, as part of our continuing efforts to strengthen cybersecurity awareness and action. This program will provide basic cybersecurity information and training to the most vulnerable sectors of our countries and regions including schoolchildren, small businesses, and older people. QUAD partners will lead this campaign with industry, non-profits, academia, and communities to maximize its effectiveness and reach.

7. Space

As leaders in space, QUAD countries are strengthening cooperation and pooling collective expertise to exchange satellite data, enable capacity-building, and consult on norms and guidelines. QUAD partners will maintain their commitments to the free, complete, and open sharing of space-based civil Earth observation data. They will jointly develop and promote the concept of Open Science in the region and globally. The United States will coordinate with QUAD partners on its cooperative civil Earth observation programs, including the National Aeronautics and Space Administration (NASA) GLOBE and DEVELOP programs; the National Oceanic and Atmospheric Administration (NOAA) Community Satellite Processing Package (CSPP) and Satellite Proving Ground Flood Mapping Portal; as well as the US Geological Survey (USGS) National Land Imaging Program. As extreme weather events become increasingly common in the Indo-Pacific, QUAD partners will convene technical experts to drive new cooperation and set the stage for additional disaster mitigation,

humanitarian assistance, and disaster relief workshops or training among QUAD partners. The QUAD partners intend to host a two-day seminar on implementing the Long-Term Sustainability (LTS) Guidelines for Indo-Pacific countries focused on LTS implementation and how LTS implementation can lead to positive changes in domestic policy, regulations, and outcomes.

8. Infrastructure

To help meet the Indo-Pacific's enormous infrastructure needs, QUAD leaders launched the QUAD Infrastructure Coordination Group, which will deepen collaboration and pursue complementary actions, including digital connectivity, transportation infrastructure, clean energy, and climate resilience. In Tokyo, the QUAD's respective heads of development-financing agencies met to discuss enhanced engagement to address the infrastructure-financing gap in the region. This high-level effort—which includes Australia's Department of Foreign Affairs and Trade and Export Finance Australia; India's EXIM; Japan Bank for International Cooperation; and the US International Development Finance Corporation—will coordinate strategic approaches among QUAD leader countries and with the private sector to leverage solutions-oriented tools that support investments in critical sectors such as health care, clean energy, and climate, digital connectivity, sustainable infrastructure, and supply chains.

9. Humanitarian Assistance and Disaster Relief

The QUAD established a new humanitarian assistance and disaster relief (HADR) mechanism. Through the QUAD Humanitarian and Disaster Relief Mechanism, QUAD partners will be able to coordinate and mobilize our civilian-led disaster assistance efforts, with support from civil defense and military assets when needed, to respond to disasters in the Indo-Pacific. The Partnership provides a framework for QUAD partners to coordinate joint disaster responses and better understand their respective HADR operations. QUAD partners may provide collaborative or coordinated assistance as requested by an affected state in a disaster's crisis alert, crisis response, or post-crisis-review phases. QUAD partners will also be able to work together to improve crisis preparedness and early warning.

10. Indo-Pacific Economic Framework for Prosperity.

To start with, on May 23, 2022, the United States, Australia, Brunei, Darussalam, India, Indonesia, Japan, the Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, and Vietnam of the Indo-Pacific region joined Indo-Pacific Economic Framework to share a commitment to a free, open, fair, inclusive, interconnected, resilient, secure, and prosperous Indo-Pacific area to deepen economic engagement among partners for continued growth, peace, and prosperity. This collective invites participation from additional Indo-Pacific partners after due discussion and deliberations. This framework is intended to advance resilience, sustainability, inclusiveness, economic growth, fairness, and competitiveness for our economies to contribute to regional cooperation, stability, prosperity, development, and peace. This

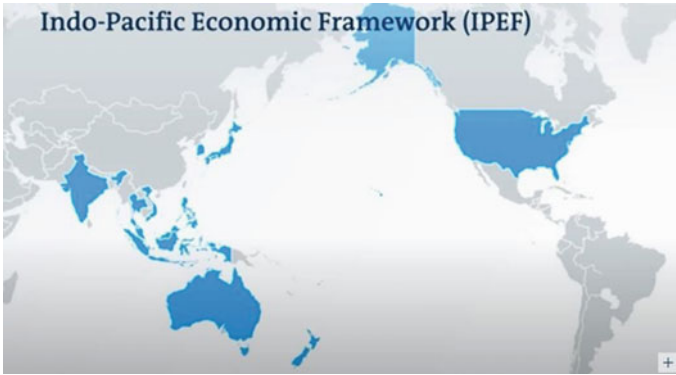


Fig. 40 Countries joined IPEF during Tokyo Summit. *Source* Author

launched collective discussions toward future negotiations on the following pillars. Administratively and politically, it was a smooth launch at short notice and easy to conclude since there are no usual trade tariff concessions of a trade treaty requiring democratic consensus are not there (Fig. 40).

Trade: To build high-standard, inclusive, accessible, and fair-trade commitments and develop new and creative approaches in trade and technology policy that advance a broad set of objectives that fuel economic activity and investment, promote sustainable and inclusive economic growth, and benefit workers and consumers. This includes but is not limited to, cooperation in the digital economy.

Supply Chains: Committed to improving transparency, diversity, security, and sustainability in our supply chains to make them more resilient and well-integrated, coordinate crisis response measures; expand cooperation to better prepare for and mitigate the effects of disruptions to better ensure business continuity; improve logistical efficiency and support; and provide access to necessary raw and processed materials, semiconductors, critical minerals, and clean energy technology.

Clean Energy, Decarbonization, and Infrastructure: In line with our Paris Agreement goals and efforts to support the livelihood of people and workers, accelerate the development and deployment of clean energy technologies to decarbonize our economies and build resilience to climate impacts.

This involves deepening cooperation on technologies, mobilizing finance, including concessional finance, and seeking ways to improve competitiveness and enhance connectivity by supporting the development of sustainable and durable infrastructure and by providing technical assistance.

Tax and Anti-Corruption: Committed to promoting fair competition by enacting and enforcing the effective and robust tax, anti-money laundering, and anti-bribery regimes in line with existing multilateral obligations, standards, and agreements to curb tax evasion and corruption in the Indo-Pacific region. This involves sharing expertise and seeking ways to support the capacity-building necessary to advance accountable and transparent systems.

5.6 The Fifth Summit Quad Leaders' Joint Statement on May 20, 2023, Hiroshima [62]

Prime Minister Anthony Albanese of Australia, Prime Minister Narendra Modi of India, Prime Minister Kishida Fumio of Japan, and President Joseph R. Biden, Jr. of the United States, met for the third in-person Quad Leaders' Summit hosted by Prime Minister Albanese.

Together, we reaffirm our steadfast commitment to a free and open Indo-Pacific that is inclusive and resilient. The global strategic and economic environment is changing rapidly—with direct impacts on countries in the region. We believe we should navigate this time of uncertainty and opportunity together, working closely with our Indo-Pacific partners. We accept that all countries have a role in contributing to regional peace, stability, and prosperity, as well as upholding international law, including the principles of sovereignty and territorial integrity and the rules-based international order. We seek a region where no country dominates, and no country is dominated—one where all countries are free from coercion and can exercise their agency to determine their futures. This shared vision unites our four nations.

As Indo-Pacific countries, Quad partners are deeply invested in our region's success. Harnessing our collective strengths and resources, we support the region's development, stability, and prosperity through the Quad's positive, practical agenda. Regional countries' priorities guide our work and respond to the region's needs. We are and will continue to be transparent in what we do. Respect for the leadership of regional institutions, including the Association of Southeast Asian Nations (ASEAN), the Pacific Islands Forum (PIF), and the Indian Ocean Rim Association (IORA), is and will remain at the center of the Quad's efforts.

The Quad Leaders' Vision Statement we have issued today sets out our shared vision for the Quad and the Indo-Pacific region based on these principles.

Today we reaffirm our consistent and unwavering support for ASEAN.

Centrality and unity. We are committed to ensuring the Quad's work is aligned with ASEAN's principles and priorities and continues supporting the ASEAN Outlook on the Indo-Pacific (AOIP) implementation. We underscore ASEAN's regional leadership role, including in the East Asia Summit, the region's premier leader-led forum for strategic dialogue, and the ASEAN Regional Forum. We strongly support Indonesia's 2023 ASEAN Chairmanship and its Chair theme, "ASEAN Matters: Epicentrum of Growth." We will continue strengthening our respective relationships with ASEAN and seek opportunities for greater Quad collaboration to support the AOIP.

We recommit to working in partnership with Pacific Island countries to achieve shared aspirations and address shared challenges. We reaffirm our support for Pacific regional institutions that have served the region well over many years, foremost the PIF, and warmly welcome Cook Islands assuming the PIF Chair in 2023. We continue to support the objectives of the 2050 Strategy for the Blue Pacific Continent and commit to working with partners, including through Partners in the Blue Pacific, to support engagement with these objectives. We welcome the third Summit of the Forum for India-Pacific Islands Cooperation and the US–Pacific Island Forum

meeting, both to be held in Papua New Guinea in the coming days. We also applaud Japan's long-standing engagement with Pacific Island countries through the Pacific Islands Leaders Meeting (PALM) and Australia's deep and enduring commitment to the Pacific as part of the Pacific family, including as a founding member of the PIF.

In these efforts, Quad Leaders will listen to and be guided by Pacific priorities, including climate action, ocean health, resilient infrastructure, maritime security, and financial integrity. In particular, we acknowledge climate change remains the single greatest threat to the livelihoods, safety, and well-being of the peoples of the Pacific and applaud Pacific Island countries' global leadership on climate action.

We remain committed to strengthening cooperation in the Indian Ocean region. We welcome the work of IORA as the Indian Ocean region's premier forum for addressing the region's challenges. We recognize India's leadership in finalizing the IORA Outlook on the Indo-Pacific (IOIP) and express our support for its implementation. We thank Bangladesh for its term as IORA Chair and commit to working with Sri Lanka and India as they assume the roles of IORA Chair and Vice Chair this year.

We, the countries of the Quad, will work together to be a global force for good. We will bring our combined resolve to support each other.

International leadership in 2023 included Australia's Quad hosting, Japan's G7 presidency, India's G20 presidency, and the United States' APEC host year.

The Quad's positive, practical agenda.

We recognize the urgent need to address the climate crisis, which poses tremendous environmental, social, and economic challenges for our region. Today we underline our dedication to taking significant action on climate change—individually and collectively. We will continue to support climate mitigation, adaptation, and resilience efforts in alignment with the United Nations Framework Convention on Climate Change and the Paris Agreement and regional architecture, including ASEAN, the PIF, and IORA. We will continue collaborating on green shipping and ports, disaster risk management, exchanging climate information, and capacity-building support for Article 6 implementation of the Paris Agreement. Under the Climate Information Services Initiative, we plan to coordinate our collective resources to support early warning systems in the Indo-Pacific, including through the Pacific-led Weather Ready Pacific initiative and the long-standing leadership of the Pacific Meteorological Council. We also intend to provide support through global partnerships such as the Coalition for Disaster Resilient Infrastructure (CDRI) and its Infrastructure for Resilient Islands States (IRIS) initiative.

Achieving sustainable consumption and production is critical to global efforts to achieve the 2030 Agenda and Sustainable Development Goals (SDGs), environment, and climate ambitions. We will work together to seek meaningful outcomes on climate action and the clean economy transition in the Indo-Pacific Economic Framework for Prosperity (IPEF).

The latest Intergovernmental Panel on Climate Change report clarifies that rapid and far-reaching transitions are needed across all sectors and systems. As we move to a net-zero world, we underscore that it is critical to strengthen our cooperation to ensure better access to affordable, reliable, and secure clean energy in the Indo-Pacific. We will work together to increase the region's access to climate finance and

climate-smart technology. Under the Quad Climate Change Adaptation and Mitigation Package (Q-CHAMP), launched in 2022, we continue to work with Indo-Pacific partners to enhance climate and clean energy cooperation and promote adaptation and resilience. In this regard, we welcome the Sydney Energy Forum and the Quad Clean Hydrogen Partnership meeting hosted by Australia and India in July 2022.

Building on those foundations, we are issuing a Statement of Principles on Clean Energy Supply Chains in the Indo-Pacific. This provides a basis for regional engagement in clean energy supply chain development. The principles promote diverse, secure, transparent, resilient clean energy supply chains and support a sustainable and inclusive transition. We also announce a Clean Energy Supply Chains initiative to accelerate Indo-Pacific's clean energy transition. This initiative will facilitate research and development and feasibility study projects to lower clean energy manufacturing and deployment costs, enhance regional energy security, and expand and diversify the regional production of necessary materials and technologies.

The COVID-19 pandemic has shown us how vital health security is to our societies, economies, and our region's stability. In 2021 and 2022, Quad partners stepped up to help meet the region's most pressing need, delivering more than 400 million safe and effective COVID-19 vaccine doses to Indo-Pacific countries and almost 800 million amounts globally, bilaterally, and in partnership with COVAX.

Today, we announce the evolution of our Quad Vaccine Partnership into a broader Quad Health Security Partnership. Through this partnership, we will strengthen our coordination and collaboration to support health security in the Indo-Pacific. We plan to implement a suite of activities to build the region's capacity to detect and respond rapidly to outbreaks of diseases with epidemic and pandemic potential. These activities include support for health workforce development, disease surveillance, electronic health information systems, and coordination of outbreak responses, such as the Quad Pandemic Preparedness Exercise.

We will continue cooperation with Indo-Pacific partners to meet the region's infrastructure priorities. Delivering on our commitment at the 2022 Quad Leaders' Summit, we will continue to support access to quality, sustainable, and climate-resilient infrastructure investments in our region. We aim to ensure the investments we support are fit for purpose, demand-driven, responsive to countries' needs, and do not impose unsustainable debt burdens. We will build on ongoing programs for Indo-Pacific countries, including training and capacity-building focused on digital and economic connectivity, clean energy, and climate-resilient power sector infrastructure. We continue to strengthen our capacity to manage debt issues, including, under the G20 Common Framework and promote debt sustainability and transparency.

Today, we announce a new initiative to boost infrastructure expertise across the Indo-Pacific: the 'Quad Infrastructure Fellowships Program.' The initiative aims to empower over 1,800 of the region's infrastructure practitioners to design, build, and manage quality infrastructure in their home countries.

The Quad is committed to improving the region's connectivity by developing resilient infrastructure. We recognize the urgent need to support quality undersea cable networks in the Indo-Pacific, vital to global growth and prosperity. Today we announce a new 'Quad Partnership for Cable Connectivity and Resilience.' The

Partnership will strengthen cable systems in the Indo-Pacific, drawing on Quad countries' world-class expertise in manufacturing, delivering, and maintaining cable infrastructure.

Quad partners' export credit agencies make an essential contribution to the prosperity of the Indo-Pacific. We welcome ongoing efforts to enhance cooperation among Quad partners' export credit agencies: including through a Memorandum of Cooperation between ECGC Limited of India, Export Finance Australia (EFA), Nippon Export and Investment Insurance (NEXI) of Japan, and Export-Import Bank of the United States (USEXIM).

We recognize the transformative power of technology, including digital public infrastructure, to support sustainable development in the Indo-Pacific and deliver economic and social benefits. We are stepping up our efforts to strengthen supply chain resilience and improve the region's digital connectivity through access to critical and emerging technologies and advanced telecommunications technology, including 5G networks.

Today, we partner with Palau to establish a deployment of Open Radio Access Networks (Open RAN), the first in the Pacific. The Quad is committed to ensuring regional countries are not left behind as telecommunications markets and network architectures evolve. We support access to innovations, such as Open RAN, that enable more excellent vendor choices for countries to expand and modernize their telecommunications networks. We also welcome the release of the Open RAN Security Report, which is expected to promote industry investment in approaches to telecommunications that are demonstrably open, interoperable, trusted, and secure.

The Quad International Standards Cooperation Network and the Quad Principles on Critical and Emerging Technology Standards, released today, reflect our support for industry-led, consensus-based multi-stakeholder approaches to developing technical standards.

We welcome the private sector-led Quad Investors Network (QUIN) launch, which aims to facilitate investments in strategic technologies, including clean energy, semiconductors, critical minerals, and quantum.

We intend to support joint research to advance innovation in agriculture through emerging technologies designed to empower farmers everywhere to increase yield and resistance.

We reaffirm our commitment to more secure cyberspace and fostering an international digital economy that works for everyone. Quad partners will continue collaborating to enhance regional capacity and resilience to cyber incidents and threats. We welcome the first Quad Cyber Challenge, held earlier this year, to promote cyber awareness and empower participants across the Indo-Pacific to protect themselves online. We also include the Quad Joint Principles for Secure Software and the Quad Joint Principles for Cyber Security of Critical Infrastructures and efforts to develop a guiding framework for ensuring supply chain security and resilience. These principles strengthen our region's defenses against cyber threats to the software supply chain and critical infrastructure and services.

We recognize the importance of space technologies and space-related applications in responding to climate change and disasters and enhancing the sustainable use of

oceans and marine resources. We reaffirm our commitment to supporting capacity-building for countries in the region. The Quad Space Working Group will explore avenues to deliver Earth Observation data and other space-related applications to assist nations across the Indo-Pacific in strengthening climate early warning systems and better managing the impacts of extreme weather events. We commit to the open sharing of civil Earth Observation data. We will continue to consult each other and the region on peaceful, safe, and sustainable use of outer space. We announce our intention to share expertise and experience in the area of situational awareness. We commit to strengthening our commercial space cooperation, including convening a business forum in 2023.

We are pleased that the Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA), announced at the 2022 Tokyo Quad Leaders' Summit, is underway.

Through IPMDA in its pilot phase, we provide near-real-time, integrated, and cost-effective maritime domain data to Southeast Asia and the Pacific naval agencies. We will expand coverage to partners in the Indian Ocean region in the coming months. This supports our regional partners in combatting illicit maritime activities, including illegal, unreported, and unregulated fishing, and responding to climate-related and humanitarian events. We are committed to deepening engagement with regional partners to support maritime safety and security and uphold international law.

At the 2021 Quad Leaders' Summit in Washington, we launched the Quad Fellowship. This year, we welcome the first cohort of Quad STEM Fellows, who will begin their studies in the United States in August 2023. Our one hundred Quad Fellows from all four Quad countries represent the best and brightest of our next generation. This inaugural class's diversity and dynamism will help ensure our nations remain at the forefront of innovation, and we wish them well.

Global and regional issues

We remain fully resolved to uphold peace and stability in the Indo-Pacific maritime domain. We strongly oppose destabilizing or unilateral actions that seek to change the status quo by force or coercion. We emphasize the importance of adherence to international law, mainly as reflected in the United Nations Convention on the Law of the Sea (UNCLOS), and the maintenance of freedom of navigation and overflight in addressing challenges to the maritime rules-based order, including those in the East and South China Seas. We express grave concern at the militarization of disputed features, the dangerous use of coastguard and maritime militia vessels, and efforts to disrupt other countries' offshore resource exploitation activities. We emphasize that disputes should be resolved peacefully and following international law, without threat or use of force.

Together with our global and regional partners, we will bolster international institutions and initiatives that underpin global peace, prosperity, and development. We reiterate our unwavering support for the United Nations (UN) Charter and the three pillars of the UN system. In consultation with our partners, we will work collectively to address attempts to unilaterally undermine the integrity of the UN, its Charter, and its agencies. We seek to strengthen and reform the multilateral system to reflect contemporary realities better and meet the aspirations of the Indo-Pacific region.

We remain committed to a comprehensive UN reform agenda, including expansion in permanent and non-permanent categories of Membership of the UN Security Council. We reaffirm our commitment to implementing the 2030 Agenda and achieving its Sustainable Development Goals (SDGs). We underscore the importance of comprehensively achieving the SDGs without selectively prioritizing a narrow set of such goals. We reaffirm that the UN is central in supporting countries' implementation.

We stand for adherence to international law, peaceful resolution of disputes, and respect for principles of the UN Charter, including territorial integrity and sovereignty of all states. In this context, today, we express our deep concern over the war raging in Ukraine and mourn its terrible and tragic humanitarian consequences. We recognize its severe impacts on the global economic system, including food, fuel, energy security, and critical supply chains. We will continue to render humanitarian assistance to Ukraine for its recovery. Conscious that ours must not be an era of war, we remain committed to dialogue and diplomacy. We support a comprehensive, just, and lasting peace consistent with the UN Charter. In this context, we concur that nuclear weapons use, or threat of use, is severe and inadmissible.

We condemn North Korea's destabilizing ballistic missile launches and pursuit of nuclear weapons in violation of multiple UN Security Council resolutions (UNSCRs). These launches pose a grave threat to international peace and stability. We urge North Korea to abide by all its obligations under the UNSCRs, refrain from further provocations, and engage in substantive dialogue. We recommend that North Korea resolve the abductions issue immediately. We reaffirm our commitment to the complete denuclearization of the Korean Peninsula consistent with relevant UNSCRs and call on all countries to fully implement these UNSCRs. We stress the importance of addressing the proliferation of nuclear and missile technologies related to North Korea in the region and beyond.

We remain deeply concerned by Myanmar's deteriorating situation and call for an immediate cessation of violence. We call for the release of all those arbitrarily detained, unhindered humanitarian access, the resolution of the crisis through constructive dialogue, and the transition of Myanmar toward an inclusive democracy. We reaffirm our consistent support of ASEAN-led efforts, including the work of the ASEAN Chair and Office of the Special Envoy. We call for full implementation of all commitments under the ASEAN Five-Point Consensus.

We unequivocally condemn terrorism and violent extremism in all its forms and manifestations, including cross-border terrorism. We are committed to international cooperation and will work with our regional partners comprehensively and sustainably to strengthen the capability to prevent, detect, and respond to threats posed by terrorism and violent extremism, consistent with international law. We are committed to working together to promote accountability for the perpetrators of such terrorist attacks. We reiterate our condemnation of terrorist attacks, including the 26/11 attacks in Mumbai and Pathankot, and our commitment to pursuing designations, as appropriate, by the UN Security Council 1267 Sanctions Committee. We will strengthen our cooperation through the new Working Group on Counterterrorism announced during the Quad Foreign Ministers' Meeting in March 2023.

We endorse the outcomes of the 3 March Quad Foreign Ministers' Meeting in New Delhi and the Ministers' Joint Statement committing to deepening practical and positive cooperation for the benefit of the Indo-Pacific region. India will host our next in-person Quad Leaders' Summit in 2024.

We, the Quad Leaders, remain firm in our resolve to meet our region's challenges and transparent in our vision for a free and open Indo-Pacific that is stable, prosperous, and inclusive. In doing so, we are committed to working in partnership with Indo-Pacific countries—large and small—in deciding our future and shaping the region we all want to live.

6 Indo-Pacific Policies, Strategies, and Programs of Outside or Peripheral Nations

France published Indo-Pacific strategy papers in 2018 and 2019; Germany and the Netherlands followed in September and November 2020, respectively. Then Canada had its Indo-Pacific Strategy in November 2022. France, Germany, and the Netherlands have also been working together to promote an Indo-Pacific concept or vision to be adopted by the EU.

France was the first EU member state to develop its Indo-Pacific strategy. French President Emmanuel Macron outlined his country's position in a speech at the Garden Island naval base in Australia in May 2018 about a new Indo-Pacific France-India-Australia axis. Official documents were published by the French Ministry of Defense (in 2018, updated in May 2019, and another later in 2019) and by the Ministry of Foreign Affairs (June 2019).

The German 'Policy Guidelines for the Indo-Pacific,' published first in German in September 2020 and shortly afterward in English, was approved by the German cabinet, thus representing a whole-of-government approach. A short Dutch 'non-paper'¹ followed in November 2020, of which no official English translation has been published. In May 2019, the government of the Netherlands also published a new China strategy. Both the German and Dutch 'guidelines' on the Indo-Pacific make it clear from the beginning that they are to be understood as contributions and building blocks to lead to an EU position in the Indo-Pacific.

To get the discussion on the Indo-Pacific at the EU, France, Germany, and the Netherlands wrote a 'non-paper' (which has so far remained unpublished) in the autumn of 2020. Their initiative found support from other member states in the EU, including Portugal, Poland, Italy, and Sweden. It was first discussed on December 8, 2020, at the Asia-Oceania Working Party (COASI) meeting. It continued in 2021. Four areas have been mentioned for the EU to focus on trade; connectivity; maritime security; and global issues such as climate change and biodiversity. While trade is a given since the EU can only negotiate free trade agreements for connectivity with Asia, maritime security, and climate change, the EU has broad frameworks that could be modified to accommodate a shift to the Indo-Pacific.

When Nations geographically outside the Indo-Pacific Region have their Indo-Pacific policies, strategies, and programs, the first question is why they have such initiatives. The answer is their self-interest. First, self-interest is shown by the economic zone mapped below. The map shows the European Union, the UK, France, and the Netherlands. The outside countries have economic zones within the Indo-Pacific Ocean in addition to the Indo-Pacific countries such as the US, Japan, India, and China. Furthermore, Tonga has economic zones within the Indo-Pacific, as shown in the map below. One can calculate the area of these economic zones and rank the countries based on the map below (Fig. 41).

The second reason is that the economic center of gravity is shifting from the Atlantic Ocean to the Indo-Pacific Ocean. A nation with big economic powers wants to do business with countries in the Indo-Pacific for mutual benefit. Since peace and tranquility are necessary for supply chains and financial interaction, they also want to ensure that their military can participate in the Indo-Pacific and provide stability for prosperity to safeguard economic interests. AUKUS Australia, UK, and the USA grouping with long-range nuclear-powered submarine technology transfer and production, of which the UK part is an excellent example.

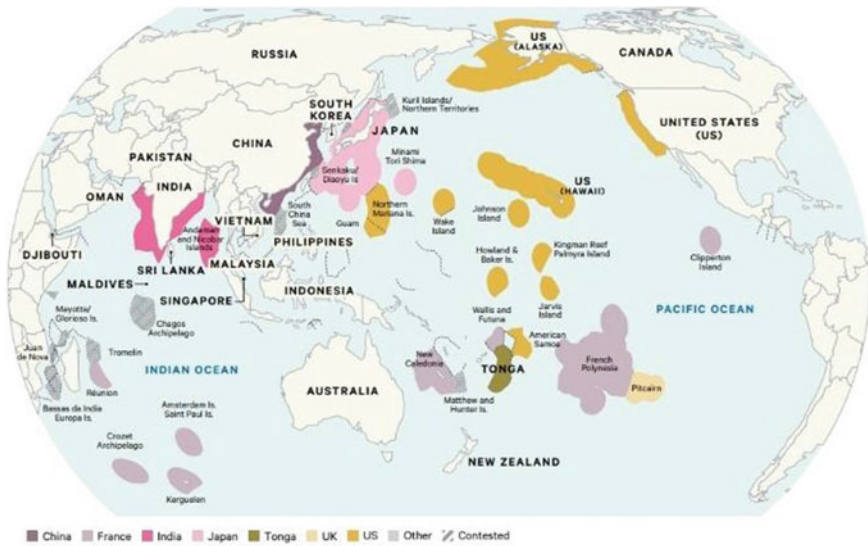


Fig. 41 Exclusive economic zones of countries given in the map. *Note* The EEZs marked are indicative only and show both settled and disputed EEZ borders. *Sources* Bordermap Consulting (n.d), ‘Home’, <https://www.bordermap.com>; Flanders Marine Institute (2019), ‘Maritime Boundaries Geodatabase, version 11’ <https://www.marineregions.org>; Natural Earth (n.d), ‘Free vector and raster map data’, naturalearthdata.com

6.1 *Indo-Pacific Strategy of France [62]*

France and the Indo-Pacific, presence and influence

France is a nation in the Indo-Pacific with its overseas departments and communities. These territories represent a population of 1.65 million people and make France the second-largest economic exclusivity zone in the world (10.2 million km²). The protection of its citizens and its sovereign territory is one of the primary missions of the French security and defense strategy in the Indo-Pacific. The French State's network in the Indo-Pacific is dense, with a diplomatic and consular presence in 39 States. The French State agencies, including research bodies, are also very present.

Furthermore, France also maintains a permanent military presence in the Indo-Pacific. Some 53,000 students from Indo-Pacific are enrolled in 95 French educational institutions in the Indo-Pacific region, attracting an increasing number of international students. Students in Asia-Oceania represent 45% of global student mobility, and France hosts 50,000 of these students. In terms of research, in a highly competitive environment (Fig. 42).

France has a network of research bodies established across the region, creating solid partnerships and renowned expertise. Commerce with the Indo-Pacific represents more than a third of French trade in goods outside of the EU, and it has grown by 49% in 10 years. The French instruments that support export and development assistance are mobilized to meet needs in those areas. The total amount outstanding for funds from the AFD Group in Indo-Pacific countries was more than €9 billion in 2020, all sectors combined.

The Indo-Pacific (excluding China) represented almost €13 billion regarding credit insurance. Furthermore, the Indo-Pacific received a fifth of the global total of loans offered by the French Treasury from 2010 to 2020. Lastly, the Indo-Pacific is an essential region for developing French educational institutions, student mobility, and cooperation in research and innovation.

France's Objectives and Actions in the Indo-Pacific

The implementation of the Indo-Pacific strategy involves concrete and diversified actions.

They were conducted in four significant areas or "pillars": security and defense; economy, connectivity, research, and innovation; multilateralism and the rule of law; and climate change, biodiversity, and sustainable management of oceans.

Pillar 1: Security and Defense

Objectives:

- Ensuring and defending the integrity and sovereignty of France, the protection of its citizens, its territories, and its Exclusive Economic Zones (EEZ).
- Contributing to the security of regional areas by promoting military and security cooperation.
- Preserving, alongside its partners, access to communal areas in a context of strategic competition and increasingly restrictive military environments (Fig. 43).

- Participating in maintaining strategic stability and military balances of power through international action based on multilateralism.
- Anticipating security risks brought about by climate change.

Examples of action: monitoring sovereign areas; organizing multilateral exercises; participating in rescue operations for people and fishing monitoring operations; affirming the respect of international law and the freedom of navigation; cooperating in sharing of maritime information; deepening interoperability with partners; and cooperating on the issues of climate and environmental security.

Pillar 2: Economy, connectivity, research, and innovation

Objectives:

- Ensuring diversification of the supply of strategic goods and reducing dependencies.
- Promoting existing international standards and making them prevail to establish a fair, competitive framework.
- Meeting needs in terms of connectivity and infrastructure.
- Supporting efforts of French companies in the Indo-Pacific region.
- Deepening research and innovation partnerships.

Examples of actions: entering partnerships with regional countries to secure supply chains; implementing the G20 Principles for Quality Infrastructure Investment; making efforts on renewable energy infrastructure; accompanying French companies and mobilizing “Team France”; strengthening cooperation efforts in research, particularly in health.

Pillar 3: Multilateralism and the Rule of Law

Objectives:

- Promoting multilateralism in countries in the Indo-Pacific region.
- Contributing to strengthening regional cooperation forums.
- Fostering strong involvement and better visibility of the European Union.
- Ensuring the central nature of the rule of law and the importance of the law of the sea.

Examples of actions: working with regional countries in international organizations; supporting a multilateral response to the COVID-19 pandemic; enhancing the partnership with ASEAN and the regional organizations of the Indian Ocean; undertaking regional action in the Pacific in response to COVID-19; adopting an ambitious EU strategy for the Indo-Pacific; promoting the French model of ocean governance and maritime security.

Pillar 4: Climate change, biodiversity, sustainable management of oceans

Objectives:

- Increasing partner involvement in the region in fighting climate change and improving energy transition.

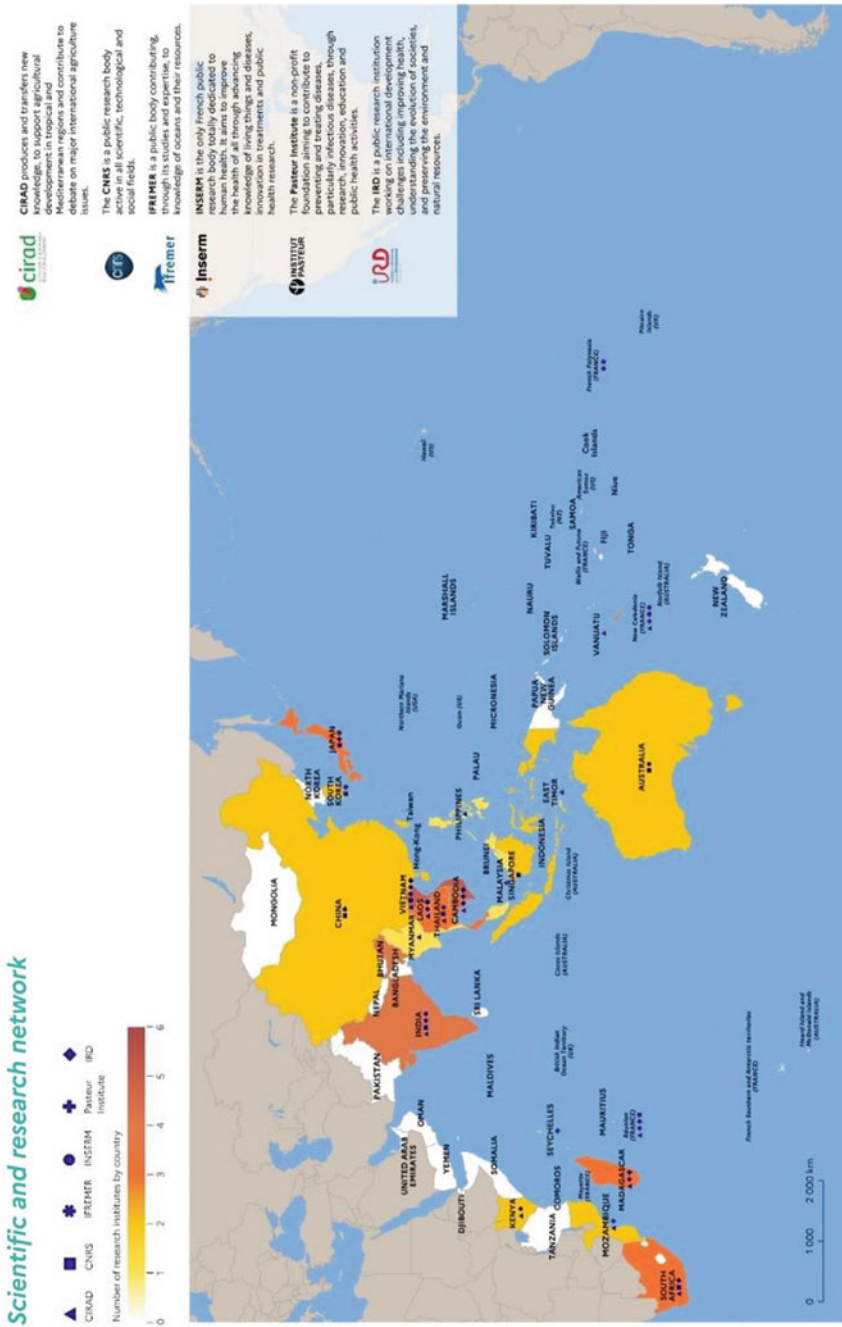


Fig. 43 Presence of France in the Indo-Pacific Scientific and research networks. Source [62]

- Fostering strengthening of actions for biodiversity.
- Developing partnerships for ocean protection.
- Contributing to improving natural disaster response.
- Enhancing the use of the skills of our territories and regional cooperation on all these issues.

Examples of actions: mobilizing countries in the region around ambitious climate objectives; making a specific effort in solar energy; renewing the KIWA initiative and promoting the High Ambition Coalition for Nature and People; implementing partnerships with our main partners in the blue economy; building capacities for response to natural disasters; forming regional partnerships with French research institutions established in the territories.

6.2 Policy Guidelines for the Indo-Pacific Region

Germany—Europe—Asia: Shaping the Twenty-First Century Together [63]

The Indo-Pacific is becoming the key to shaping the international order in the twenty-first century because the region has a Oneng, well-educated population and can look back on decades of considerable.

Economic growth. Twenty of the world's thirty-three megacities are in this region. With growing economic output, the countries in the area are becoming increasingly self-confident partners in international cooperation, including in the fight against climate change and the global loss of biodiversity.

Interests

The Federal Government of Germany is guided by the following interests in its policy on the Indo-Pacific region:

- Peace and security.
- Diversifying and deepening relations.
- Neither unipolar nor bipolar.
- Open shipping routes.
- Open markets and free trade.
- Digital transformation and connectivity.
- Protecting our planet.
- Access to fact-based information.

Principles

The Federal Government of Germany is guided by the following principles for its policy on the Indo-Pacific region:

- European action.
- Multilateralism.
- The rules-based order.

- United Nations Development Goals.
- Human rights.
- Inclusivity.
- Equals partnership.

Initiatives

Strengthening multilateralism

- The Federal Government will strategically position and step up its engagement vis-à-vis ASEAN.
- The Federal Government will strengthen the role of the EU as a partner of ASEAN in close cooperation with its EU partners.
- The Federal Government will intensify its cooperation with other regional institutions in the Indo-Pacific region.
- The Federal Government will work to maintain the rules-based order together with partners in the Indo-Pacific region.
- The Federal Government will work with France to elaborate a European strategy on relations with the Indo-Pacific region.

Tackling climate change and protecting the environment

- The Federal Government will step up its cooperation in the Indo-Pacific region in climate protection, adaptation to climate change, biodiversity protection, renewable energies, and energy efficiency.
- The Federal Government will expand its multilateral engagement with the Indo-Pacific region in climate and environmental protection.

Strengthening peace, security, and stability

- The Federal Government will increase its security policy engagement in the Indo-Pacific region.
- The Federal Government will continue implementing measures for civil crisis prevention, conflict management, and peacebuilding.
- The Federal Government will increase its arms control and export control policy engagement in and with the Indo-Pacific region.

Promoting human rights and the rule of law

- The Federal Government will work to strengthen the human rights situation in Indo-Pacific region countries and enforce international human rights standards.
- The Federal Government will engage in open and critical dialogue with governments in the Indo-Pacific region within a bilateral framework at the level of the European Union (human rights dialogues) and in multilateral forums, particularly the UN Human Rights Council. In this regard, it will also support those persecuted for political reasons.
- The Federal Government will promote disseminating fact-based information in the Indo-Pacific region and strengthen resilience against disinformation through concrete projects. It will establish a Regional German Information Centre in Singapore to this end.

- The Federal Government will support further projects in the Indo-Pacific region within the framework of the rule of law promotion, particularly in access to justice for all, subject to the willingness of the respective state to implement reforms and the prospects of success of the measures.

Strengthening rules-based, fair, and sustainable free trade

- The Federal Government will improve the framework conditions for diversifying and intensifying economic relations in the Indo-Pacific region.
- The Federal Government will support the EU's trade policy and work to strengthen the multilateral trade system with the WTO at its center in cooperation with the countries of the Indo-Pacific region.
- The Federal Government will lend its active support to the EU's trade policy in the Indo-Pacific region to eliminate existing obstacles to trade and investment on both sides as well as to enshrine binding rules on environmental and social standards, climate protection and competition policy, state-owned companies, subsidies, and the protection of intellectual property.
- The Federal Government will support the engagement of German companies in the Indo-Pacific region.
- The Federal Government will put in place targeted measures to make it easier for students, skilled workers, and specialists to come to Germany or to relocate (for a limited period) for study, training, or employment purposes by further expanding personnel and organizational capacities for assessing visa applications and granting visas, if possible, within the scope of existing resources.

Rules-based networking and the digital transformation of regions and markets

- The Federal Government will expand connectivity both to and within the Indo-Pacific region.
- The Federal Government will promote and help shape digital transformation.
- The Federal Government will strengthen Germany's competitiveness in key technologies.
- The Federal Government will support and strategically promote the digital sovereignty of Germany and the EU, particularly in the Indo-Pacific region.

Bringing people together through culture, education, and science

- The Federal Government will expand its cooperation with the Indo-Pacific region in culture, education, and science.

6.3 Indo-Pacific: Guidelines for Strengthening Dutch and EU Cooperation with Partners in Asia [64]

The Netherlands has significant economic and geopolitical interests in the Indo-Pacific, its biggest export market outside Europe with excellent growth potential. The COVID-19 crisis has allowed us to consider ways of reducing one-sided dependencies

and diversifying suppliers from the Indo-Pacific region. The Netherlands must work with the Indo-Pacific to ensure sustainable green growth, economic recovery, and responsibly organized digitalization and critical technology management.

In a world where democracy, the rule of law, human rights, freedom, free trade, and a properly functioning multilateral world order are increasingly under pressure, the Netherlands and the EU must join forces in the Indo-Pacific region and with ASEAN and work with the countries of the Indo-Pacific region to safeguard peace and security, reduce tensions on trade issues, promote maritime safety and unhindered safe passage on shipping routes, and combat economic and cyber espionage and cyberattacks on vital infrastructure.

Elements of a European Vision of the Indo-Pacific Security and Stability

Given the EU's significant economic, political, and geopolitical interests in the Indo-Pacific, it must aim for de-escalation, inclusion, and protection of the commons. At the country level, the EU has a role to play in helping to preserve the balance of power and—where necessary—in providing a counterweight to the strategic economic and military influence of one or more great powers.

The EU's basic principle must be the protection and development of the international legal order. The EU must partner with countries in the region to guarantee safe passage and maritime security. This should happen primarily through compliance with the United Nations Convention on the Law of the Sea (UNCLOS) and the peaceful settlement of disputes using the appropriate mechanisms, continued participation in the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) could also help attain this goal.

Given the militarization of the region and the presence there of seven nuclear weapons states (China, the US, Russia, India, Pakistan, France, and the UK), plus North Korea with its nuclear ambitions, the EU must work actively with Indo-Pacific countries within the existing framework for promoting non-proliferation, disarmament, and export controls. This framework includes the Non-Proliferation Treaty (NPT), the Missile Technology Control Regime (MTCR), and the Hague Code of Conduct against Ballistic Missile Proliferation (HCMC). The EU should promote transparency, confidence-building measures, and verifiable agreements, including outer space.

The EU should also pursue partnerships with countries in the region aimed at the universalization and effective implementation of other agreements on arms control, peace, and security, including the Comprehensive Nuclear-Test-Ban Treaty (CTBT), negotiation of a Fissile Material Cut-off Treaty (FMCT), and agreements on conventional weapons like the Arms Trade Treaty (ATT), the Convention on Cluster Munitions, the Ottawa Convention on landmines and the Program of Action on Small Arms and Light Weapons (SALW).

China is currently the only nuclear power rapidly expanding its nuclear arsenal. Moreover, exceptionally little is known about the exact composition of the Chinese arsenal, and how it will affect developments in the region and beyond is unclear. China must be reminded of its global and regional responsibility in this regard. There should

also be more support within the EU for US efforts to arrive at a trilateral arms control agreement, including China and Russia.

The EU must continue contributing, with knowledge, projects, and capacity-building, to the fight against extremism and terrorism in the Indo-Pacific.

Collaborating with partners in the Indo-Pacific region, the EU must seek to work more closely with countries that share the EU's and the Netherlands' concerns about preserving an open economy, effective multilateralism, and keeping the international legal order functioning. In a world where democracy, the rule of law, human rights, freedom, free trade, and a properly functioning multilateral world order are increasingly under pressure, it is essential to work more in concert with democratic, like-minded countries to defend and promote our shared interests. The EU must promote democratic values and norms and continue to dialogue with all countries in the region. To do so, it can collaborate with like-minded partners, using its existing strategic and other partnerships with Australia, Japan, New Zealand, South Korea, and India, as well as the Strategic Partnership with ASEAN that the Netherlands hopes will enter into force soon. The EU must work with like-minded countries in the region to develop a better narrative and make more strategic use of investments and other activities aimed at connectivity. The EU Connectivity Strategy can play a vital role in this regard.

The Asia-Europe Meeting (ASEM) can be used as a consultation forum on current and strategic developments. The EU can financially support the Asia-Europe Foundation (ASEF) for activities promoting exchanges and collaboration in journalism, human rights, and art. The EU should seek to link up with the NATO partnerships in the region. While pursuing a work program with China and tackling COVID-19, NATO has strengthened its links with its Indo-Pacific partners (Australia, New Zealand, South Korea, and Japan) as part of its Partners Around the Globe framework. NATO's ties with Australia (an Enhanced Opportunities Partner) are the closest of these four countries. The EU should continue to work actively with governments in the Indo-Pacific countries on human rights dialogues in which the human rights situation can be discussed openly and critically.

Sustainable trade and economies

Significant economic and trade interests together bind Europe and Asia. For many countries in Asia, Europe is one of their main trading partners, if not their most significant. There is also substantial investment in both directions. Geopolitical competition and potential technological and economic disengagement could significantly affect many Asian countries, such as the Netherlands and Europe.

The COVID-19 crisis has given a strong impetus to the discussion on strategic autonomy and the resilience of value chains. The Netherlands needs to join with our EU partners and other like-minded countries to consider ways of reducing one-sided strategic dependencies and sustainably securing value chains, with a particular focus on critical technologies and raw materials. The EU should make better and more strategic use of its economic leverage to reach its geopolitical goals, deploying its full, integrated range of policy instruments for this purpose. More emphasis must

also be placed on reciprocity. Talks on free trade agreements (FTAs) with countries in the region must be continued.

The EU's aims in these talks should be:

- o To bring the negotiations on agreements with Australia and New Zealand to a positive conclusion, with the broader goal of setting standards for a modern, open trade policy.
- o Given ASEAN's importance to progress in the talks with the ASEAN countries. The EU's first agreement was reached with Singapore in 2019. In 2020, the FTA with Vietnam came up. Now progress needs to be made with Indonesia. The Netherlands would also support a resumption of negotiations with Malaysia.
- o To restart negotiations on a comprehensive, ambitious trade agreement with India.
- o Besides being a significant challenge, the global energy transition is also an opportunity to boost future earning capacity. Cooperation between the EU and the Indo-Pacific on sustainable green growth and innovation should be strengthened in the interests of both global climate ambitions and the stimulation of sustainable trade and economies.

Effective multilateralism and the international legal order

In times like these, when international tensions are rising, it is essential to strengthen multilateral cooperation and the global legal system, which are crucial for maintaining peace and security. Only multilateral consultations founded on a rules-based order will enable us to find solutions for all states' interests. Multilateral cooperation is also the only way to tackle global challenges such as climate, poverty reduction, migration, and pandemics.

The EU should strengthen regional institutions, security, and other partnerships through wide-ranging cooperation and capacity-building.

The EU needs to coordinate activities and voting at the UN and in the World Bank and other large forums, internally among EU member states and, to a greater extent, with like-minded countries. It can also strategically and systematically use its economic influence to pursue its political interests better.

The EU could explore ways of working more effectively at the multilateral level with the Small Island Developing States (SIDS). Via the European Investment Bank (EIB), the EU is a significant investor in the Pacific.

1. Sustainable connectivity.

There are many initiatives in the Indo-Pacific region focused on connectivity. In addition to the Chinese Belt and Road Initiative, Japan, India, South Korea, and ASEAN have their connectivity strategies. In 2018 the EU launched its strategy, 'Connecting Europe and Asia,' to create a distinctive profile as a partner for sustainable development in transport, digital infrastructure, energy, and people-to-people contacts. In September 2019, the EU and Japan concluded a Connectivity Partnership based on sustainability, shared norms and values, quality infrastructure, and their commitment

to guaranteeing a global level playing field, particularly in Asia and the Indo-Pacific. The EU should promote quality and fiscal, social, and ecological sustainability in a broad sense as part of all its connectivity strategies.

The EU should form connectivity partnerships with ASEAN and India modeled on its Connectivity Partnership with Japan. India has already expressed a desire to include connectivity in the agenda of the next EU-India summit. It would also like to reach agreements on further cooperation on connectivity within India as well as in the Indian subcontinent generally and in third countries, particularly in East Africa. ASEAN seeks a partnership with the EU based on a regional Master Plan on ASEAN Connectivity, which will also address the climate transition. The EU could also further explore the offer from the US and other partners to join the Blue Dot Network, as many of the efforts of the US, Japan, Australia, Canada, and so forth are focused on the Indo-Pacific region.

2. Global challenges: climate and the SDGs

The Indo-Pacific countries account for a third of global greenhouse gas emissions. While most countries in the region recognize the importance of a transition to clean energy, in practice, many of their economies are still dependent on cheap coal-fired power plants. The Indo-Pacific is the region of the world with the highest economic growth rates and a superior level of infrastructure investment, laying the foundation for their energy consumption and mix for the next 30 years. Unless the transition to clean, renewable energy in the Indo-Pacific can be accelerated, achieving the internationally agreed climate targets will be impossible.

Besides the fact that the Indo-Pacific countries are contributing significantly to climate change, the region also contains several of the most vulnerable countries already experiencing climate change's effects. These include small island states that risk disappearing underwater and countries experiencing adverse impacts on agriculture, vulnerable population groups, and densely populated urban areas. If governments in the region are not adequately prepared for climate change's influence, it could destabilize their economies, trade, and social cohesion.

Climate action is increasingly becoming a necessary precondition for economic growth. Therefore, significant gains can be made in the Indo-Pacific countries if governments and the private sector take the need for green recovery seriously. The Global Commission on Adaptation has calculated that every dollar invested in climate-smart infrastructure in developing countries between now and 2030 will generate four dollars in earnings, up to \$4.2 trillion.

Several countries in the region are strong advocates of ambitious climate policy. These countries are also active in regional and international forums on climate issues. The Netherlands and the EU can work more closely with these countries in a collective effort to maintain this elevated level of climate ambition. The EU should also work to strengthen exports of sustainable, green energy solutions to advance the climate transition in the Indo-Pacific. Collaboration is already taking place in many areas.

- The EU should further deepen and expand its cooperation on climate and the SDGs where possible, including with the SIDS.

- The EU should work to strengthen green trade flows to advance the climate transition in the Indo-Pacific.
- The EU should work toward greater cooperation on climate adaptation and in international forums in the interests of ambitious climate policy.

The Netherlands and the Indo-Pacific [64]

Under the umbrella of a European vision of the Indo-Pacific, the Netherlands will also step up its bilateral efforts to work with democratic, like-minded partners. More specifically, the Netherlands will work toward the following:

Security and stability.

- It will promote safe passage and maritime security by helping with capacity-building around the international law of the sea and exploring opportunities in the realm of defense and security.
- Will speak out more actively about international law (and breaches of international law), including concerning UNCLOS and the South China Sea.
- We will participate more often at the appropriate level in relevant gatherings on strategic issues in the Indo-Pacific region, including the annual IISS Shangri-La Dialogue (in Singapore) and the annual Raisina Dialogue (in India).
- It will strengthen collaboration and dialogue with like-minded Indo-Pacific countries on cyber issues, emphasizing cybersecurity.
- Will step up cooperation with the region on combating hybrid threats, both bilaterally and through international partnerships, to counter foreign interference.
- Will contribute to non-proliferation and disarmament by collaborating with like-minded partners in the framework of the Non-Proliferation Treaty, for example, in the Non-Proliferation and Disarmament Initiative (NPDI), and through the Proliferation Security Initiative (PSI) and export control regimes.
- Will support the NATO partnerships with Australia, New Zealand, South Korea, and Japan in the Indo-Pacific (Partners around the Globe). These are major operational partners for NATO. For example, Australia, New Zealand, and South Korea have provided troops for NATO missions, while Japan has supported several stabilization projects in Afghanistan.

A framework for cooperation with democratic, like-minded partners in Asia

- Will deepen its partnerships with countries such as Australia, India, Indonesia, Japan, South Korea, New Zealand, Singapore, Malaysia, and Vietnam through practical cooperation on issues where the Netherlands shares common interests and through annual consultations.
- Will accede to the Treaty of Amity and Cooperation in Southeast Asia to underscore its commitment to closer cooperation with ASEAN.
- It will coordinate its interventions as much as possible with like-minded Indo-Pacific countries.
- We will continue to participate in the Asia-Europe Meeting (ASEM) and make an annual financial contribution to the Asia-Europe Foundation (ASEF).

- We will continue to strive to conduct an open, critical dialogue with Indo-Pacific governments about the human rights situation in their countries and to strengthen civil society in those countries.

Sustainable trade and economies

- Will work through the EU toward reducing one-sided strategic dependencies and making value chains more dependable by exploring the scope for diversifying suppliers from the Indo-Pacific region.
- We will work toward sustainable trade and investment relations in Indo-Pacific countries, especially in economic priority countries (China, South Korea, India, Australia, Japan, and ASEAN's five original members).
- Will actively support the EU negotiations (and their conclusion) on free trade agreements with Indo-Pacific countries, Effective multilateralism, and the international legal order.
- It will act in concert with like-minded countries in the Indo-Pacific region to promote effective multilateralism and international legal order.
- Will engage in public diplomacy and other activities on the themes of the law of the sea, the cyber domain, trade law, and climate change.
- We will organize a seminar in Singapore aimed at capacity-building for experts from ASEAN countries who participate in the negotiations on the Code of Conduct for the South China Sea.
- We will continue offering annual sea law courses through the Clingendael Institute and the Netherlands Institute for the Law of the Sea (NILOS) to strengthen capacity in ASEAN countries. Where possible, the Netherlands will join in initiatives and activities from the region itself on this issue.
- Will consult with Australia and other interested, like-minded countries in the region on developments in the South China Sea.
- Will organize a cyber dialogue aimed at capacity-building for experts from ASEAN countries who participate in UN negotiations on international agreements on voluntary, non-binding norms of conduct for states and on developing a system of confidence-building measures in the digital domain.
- We will continue to offer courses on building cyber capacity in ASEAN countries, including international law in the digital domain.

Sustainable connectivity

- Will focus on digital strategy, including a spectrum of themes ranging from cybersecurity and internet regulation to innovation, artificial intelligence, e-commerce, cross-border data transfer, privacy, and national digital sovereignty.
- Join EU initiatives to strengthen Europe's strategic sovereignty, a balance between the diversification of supply and value chains, on the one hand, and reinforcement of global and multilateral free trade systems, on the other, and

- Will join in implementing the Green Deal internationally in cooperation with like-minded Indo-Pacific partners.

Global challenges: Climate and the SDGs

- Deepen and extend collaboration with other countries, including the SIDS, on climate action and the SDGs.
- Work more closely with Indo-Pacific countries to promote ambitious international and national climate policies to achieve climate goals.
- Work to promote green, sustainable energy solutions to advance the energy transition.

6.4 The EU Strategy for Cooperation in the Indo-Pacific [65]

The rationale behind the EU strategy for Indo-Pacific given by the European Union represents the generic understanding of European Countries individually and collectively of the Indo-Pacific phenomenon, namely a fast-developing economic growth potential shifting from the Atlantic in the twentieth century toward the center of gravity of Economic Development of the world at the Indo-Pacific in the twenty-first century. Therefore, the EU intends to increase its engagement with the region to build partnerships that reinforce the rules-based international order, address global challenges, and lay the foundations for a rapid, just, and sustainable economic recovery that creates long-term prosperity. This engagement will be based on promoting democracy, the rule of law, human rights, and universally agreed commitments such as the 2030 Agenda and its Sustainable Development Goals and the Paris Agreement on Climate Change.

The futures of the EU and the Indo-Pacific are inextricably linked, given the interdependence of the economies and the shared global challenges. The region includes seven G20 members—Australia, China, India, Indonesia, Japan, the Republic of Korea, and the Republic of South Africa—and the Association of Southeast Asian Nations (ASEAN), an increasingly important partner for the EU.

The EU and the Indo-Pacific are natural partner regions in trade and investment. The Indo-Pacific is both an essential source of global environmental challenges as well as a potential beneficiary of their remedies. EU and the Indo-Pacific are natural partner regions in trade and investment.

In recent years, geopolitical dynamics in the Indo-Pacific have given rise to intense competition, including tensions around contested territories and maritime zones. Democratic principles and human rights are also threatened by authoritarian regimes in the region, putting the region's stability at risk. Similarly, efforts to establish a global level playing field based on transparent trade rules are increasingly undermined by unfair trade practices and economic coercion. These developments increase tensions in trade, supply, and value chains.

The EU Strategy released in September 2021 is inclusive of all partners in the region wishing to cooperate with them when interests coincide. At the same time, and working with international partners who share similar concerns, the EU will continue to protect its vital interests and promote its values, namely democracy, human rights, and the rule of law.

The European Union is already involved with the Indo-Pacific. They intend to deepen it further by deepening relations with the QUAD leaders' countries, such as the US, Japan, Australia, and India, and then with other countries in the Indo-Pacific. They want to collaborate with the ongoing program of the QUAD in the Indo-Pacific. Some examples are given below in the figure.

EU Vision for Engagement with the Indo-Pacific.

- Solidify and defend the rules-based international order by promoting inclusive and effective multilateral cooperation based on shared values and principles, including a commitment to respecting democracy, human rights, and the rule of law.
- Promote a level playing field and an open and fair environment for trade and investment.
- Contribute to achieving the Sustainable Development Goals (SDGs), addressing climate change and environmental degradation on land and in the ocean, and supporting sustainable and inclusive socio-economic development.
- Engage in bilateral and multilateral cooperation with partners to meet the objectives of the Paris Agreement on Climate Change and the Convention on Biological Diversity (CBD).
- Pursue its long-standing multilateral and regional cooperation with the United Nations, Bretton Woods Institutions, and regional organizations such as ASEAN and the African Union in the Western Indian Ocean.
- Support truly inclusive policymaking and cooperation, where the voices of civil society, the private sector, social partners, and other vital stakeholders count.
- Establish mutually supportive trade and economic relations with the region that foster inclusive economic growth and stability and promote and facilitate connectivity.
- Engage in the region as a partner in our efforts to raise awareness of the impact of global demographic trends.

The EU's engagement with the Indo-Pacific region will be moral and long term. It will seek to:

- Deepen its engagement and reinforce its role as a dependable partner, adding value to long-standing relations with all its regional partners.
- Reinforce cooperation with multilateral and regional organizations such as ASEAN and international financial institutions to promote effective rules-based multilateralism in the Indo-Pacific region.
- Undertake crisis management, conflict prevention, and resilience-building initiatives. Work with the Member States through a Team Europe approach with concrete initiatives at country and regional levels.

European Union's Seven Priorities in the Indo-Pacific.

- sustainable and inclusive prosperity.
- Green transition.
- Ocean governance.
- Digital governance and partnerships.
- Connectivity.
- Security and defense.
- Human security.

The above incorporates the goals given below.

Resilient and Diversified Value Chains

Resilient value chains are essential for recovery. The EU will work with its Indo-Pacific partners to reinforce value chains by strengthening and diversifying trade relations and implementing existing trade agreements, finalizing ongoing trade negotiations, and developing cooperation in strategic sectors, including addressing strategic dependencies in supply chains. For semiconductors, for example, it will do so with partners such as Japan, the Republic of Korea, and Taiwan. The EU will also cooperate with partners to strengthen rules to protect international trade against unfair practices, such as industrial subsidies, economic coercion, forced technology transfers, and intellectual property theft.

Building Blocks of EU Trade Relationship

The EU is committed to further engagement on open, sustainable, and rules-based trade with partners in the Indo-Pacific region, including building support for the modernization of the World Trade Organization. Particular attention will be paid to implementing and enforcing the comprehensive trade agreements with Japan, the Republic of Korea, Singapore, and Vietnam, and the Economic Partnership Agreement (EPA) with the Pacific States, as well as the EU investment protection agreements with Singapore and Vietnam that are expected to enter into force in the coming years.

Green Transitions

- Conclude Green Alliances with like-minded partners that have signed up to the goal of climate neutrality by 2050 and other ambitious climate and environmental objectives. The first such alliance was agreed with Japan in May 2021. The EU will also build Green Partnerships with other partners.
- Continue to use the International Platform on Sustainable Finance to share best practices and seek common ground with like-minded partners on approaches and tools.
- Engage with the largest emitting countries or regional organizations that can play a decisive role in fighting climate change and promoting the global green transition.
- Continue to prioritize the transition away from coal in bilateral and multilateral engagements and international fora, including ending new coal investments, phase-out of unabated coal-fired power generation and coal mining, and engaging in just transition with the partners in the region.

- Step up its work with the region to protect biodiversity and restore degraded ecosystems on land and in the oceans. This will include collaborating with key partners on an ambitious post-2020 Global Biodiversity Framework.
- Cooperate to create the conditions for more circular production models, more resilient supply chains between the EU and the region, and more responsible resource extraction.
- Promote deforestation-free supply chains.
- Continue to promote enhanced regional and global action to tackle plastic pollution, notably by cooperating with ASEAN, Japan, and China.
- Continue high-level dialogues and other forms of engagement on the environment in the region, notably with ASEAN, Australia, China, India, Indonesia, Japan, the Republic of Korea, South Africa, and other partners showing interest.

Clean Energy and Transport

In this area, the EU intends to focus on:

- They mobilize energy dialogues, partnerships, and financial instruments for sustainable, secure, and affordable energy.
- It prioritizes a just transition toward a decarbonized, integrated energy system that considers and mitigates the impact on more vulnerable countries and regions.
- Continuing cooperation with Indo-Pacific partners on R&D on clean energy technology, including renewable hydrogen as a priority area, to enable a faster, cheaper, and more efficient energy transition.
- Boosting cooperation under the Global Covenant of Mayors for Climate and Energy with cities as drivers of climate action and clean energy transition to double the number of signatories in the region (three hundred cities by 2023).
- It is implementing its Sustainable and Smart Mobility Strategy to address the issues of decarbonization and digitalization with Indo-Pacific partners and at the International Civil Aviation Organization (ICAO) and the International Maritime Organization.
- Continuing its engagement with several Indo-Pacific economies on digitalization of transport, as well as in the rail sector, regarding the deployment of the European Rail Traffic Management System.

Ocean Governance

The EU will take action to strengthen ocean governance in the Indo-Pacific in full compliance with international law, UNCLOS, and with the primary objective of ensuring the sustainable management of the ocean's resources and safeguarding of biodiversity. Through its various Sustainable Fisheries Partnership Agreements in the region and its dialogues and working groups on Illegal, Unreported, and Unregulated (IUU) fishing, the EU will continue supporting Indo-Pacific partners in achieving fisheries management and control systems reforms. This should improve fisheries compliance and contribute to the conservation and sustainable management of marine biological resources across the region. As the largest export market for seafood products from the Indo-Pacific region, the EU is an active member of several Regional Fisheries Management Organizations.

Digital Governance and Partnership

The EU will seek to enhance its international digital partnerships in the Indo-Pacific region and set up new ones. These partnerships aim to strengthen technical, policy, and research cooperation with partners on infrastructures, digital transformation of business and public services, skills development, and facilitate digital trade. They will allow the EU and like-minded partners to ensure the development of standards for emerging technologies, including artificial intelligence, in line with democratic principles and fundamental rights. A toolbox will underpin them, drawing on regulatory cooperation, capacity-building and skills, and investment in international collaboration and research partnerships.

Research and Innovation

International cooperation in research and innovation is crucial for green and digital transitions and for promoting growth, prosperity, and social well-being. Collaboration with partners in the Indo-Pacific will be enabled under ‘Horizon Europe,’ in line with the EU’s Global Approach to Research and Innovation. It will be based on the principle of openness, balanced with greater levels of reciprocity, and seeking a level playing field based on respect for fundamental principles such as academic freedom, gender equality, ethics, integrity and inclusiveness of research, and open science and evidence-based policymaking.

Education

EU investments in education will be increased to at least 10% of the Neighborhood, Development, and International Cooperation Instrument (NDICI)—Global Europe to strengthen education systems. The recent Team Europe pledge of EUR 1.7 billion to the Global Partnership on Education will translate into increased funding for primary and secondary education, as well as Technical and Vocational Education and Training.

Connectivity

The EU will aim to promote all dimensions of connectivity with Indo-Pacific partners. The EU’s first two “Connectivity Partners,” Japan and India, are core Indo-Pacific partners, as is ASEAN with which the EU agreed to a joint Ministerial Declaration on Connectivity in December 2020. The EU will seek to collaborate with these partners on collaborative projects while seeking increased collaboration with other regional partners, such as Australia and the Republic of Korea as well as with international actors, such as the United States and Canada, both multilaterally (G7/G20) and bilaterally. The conclusion of the negotiations on the ASEAN-EU Comprehensive Air Transport Agreement (CATA), the first such region-to-region agreement encompassing thirty-seven countries, shows the EU’s determination to deepen connectivity with this region.

The EU will further:

- Strengthen relations at the highest technical level through its Transport Dialogues with regional partners, such as ASEAN, Singapore, and Japan, and shortly with the Republic of Korea and Australia.
- Continue to fund sector-specific technical cooperation, such as Aviation Partnerships with several Asian regions.
- Continue the EU bilateral maritime transport and security dialogues with strategic partners.
- Pursue space dialogues, including a security component where appropriate, and establish new exchanges with regional partners.

Health

The EU will continue to work with all Indo-Pacific partners to ensure an effective multilateral response to COVID-19 and future global health crises. This would encompass the following:

- They are helping low and middle-income Indo-Pacific partners to secure access to the COVID-19 vaccine through the COVAX facility and other means. The EU has supported many countries in the region by providing personal and medical equipment, medicines, and health expertise. India will be a focus for cooperation, including on the quality of active pharmaceutical ingredients. The future EU Health Emergency Preparedness and Response Authority will cooperate closely with global partners to address international supply chains and expand global production capacity and access to medical countermeasures.
- Enhanced multilateral cooperation aligns with the EU Pharmaceutical Strategy to secure safe and diverse pharmaceutical and health-related industrial supply chains, facilitating access to quality medicines and health products.
- Collaborative research for combating infectious diseases and improving access to medicines and health treatments. Under the 'Horizon Europe research program, Indo-Pacific partners can participate in EU-funded Research and Innovation actions.
- It connects exciting countries implementing interoperable COVID-19 certificate systems to the EU Digital COVID Certificate. The EU has made the technical specifications and underlying software publicly available in open-source format.
- They were supporting the transformation toward healthy and sustainable food systems. The EU aims to enhance cooperation with like-minded partners on its Farm to Fork and Biodiversity Strategies. The EU intends to establish dialogues on sustainable food systems with interested Indo-Pacific partners (some planning their sustainability policies and programs) or enter bilateral and multilateral arrangements to support collaboration on food safety, animal and plant health, and sustainability.
- We are working together to fight air pollution, especially in urban centers.

Highlights of proposed EU actions:

- We are engaging with Indo-Pacific partners to build more resilient and sustainable global value chains by diversifying trade and economic relations and developing technical standards and regulations that align with our values and principles.
- Completing EU trade negotiations with Australia, Indonesia, and New Zealand; resuming trade negotiations and starting investment negotiations with India; completing an Economic Partnership Agreement with the East Africa Community; assessing the possible resumption, of trade negotiations with Malaysia, the Philippines, and Thailand, and the eventual negotiation of a region-to-region trade agreement with ASEAN.
- Concluding Partnership and Cooperation Agreements (PCA) with Malaysia and Thailand; starting PCA negotiations with the Maldives and bringing the EU's upcoming Partnership Agreement with the African, Caribbean, and Pacific (ACP) to full fruition.
- Conclusion Green Alliances and Partnerships with willing and ambitious Indo-Pacific partners to fight against climate change and environmental degradation.
- We are strengthening ocean governance in the region, including increasing the EU's support for Indo-Pacific countries' fisheries management and control systems, fighting against IUU fishing, and implementing Sustainable Fisheries Partnership Agreements.
- We are expanding the network of digital partnerships with Indo-Pacific partners and exploring the possibility of new Digital Partnership Agreements.
- They are stepping up the implementation of the Connectivity Partnerships with Japan and India, supporting partners in establishing an appropriate regulatory environment, and facilitating the mobilization of the necessary funding to improve connectivity between Europe and the Indo-Pacific.
- Strengthen cooperation on research and innovation under 'Horizon Europe'; explore.
- The association to this program of eligible like-minded Indo-Pacific partners such as Australia, Japan, the Republic of Korea, New Zealand, and Singapore.
- Exploring ways to ensure enhanced naval deployments by the EU Member States to help protect the sea lanes of communication and freedom of navigation in the Indo-Pacific while boosting Indo-Pacific partners' capacity to ensure maritime security.
- One reinforces support for healthcare systems and pandemic preparedness for the least-developed countries in the Indo-Pacific region, enhancing collaborative research on infectious diseases in the Horizon Europe research program context.

The implementation of the EU strategy will include several actions, in particular: Concluding Partnership and Cooperation Agreements (PCA) with Malaysia and Thailand; starting PCA negotiations with the Maldives and bringing the EU's upcoming Partnership Agreement 5/2/22, 9:59 AM EU Strategy for Cooperation in the Indo-Pacific bringing the EU's forthcoming Agreement Partnership with the African, Caribbean, and Pacific (ACP) to full fruition and engaging with Indo-Pacific partners to build more resilient and sustainable global value chains by diversifying

trade and economic relations, and by developing technical standards and regulations that are in line with our values and principles. Completing EU trade negotiations with Australia, Indonesia, and New Zealand; resuming trade negotiations and starting investment negotiations with India; completing an Economic Partnership Agreement with the East Africa Community; assessing the possible resumption of trade negotiations with Malaysia, the Philippines, and Thailand, and the eventual negotiation of a region-to-region trade agreement with ASEAN. Conclusion Green Alliances and Partnerships with willing and ambitious Indo-Pacific partners to fight against climate change and environmental degradation. Strengthening ocean governance in the region, including increasing the EU's support for Indo-Pacific countries' fisheries management and control systems, the fight against Illegal, unreported, and unregulated fishing, implementing Sustainable Fisheries Partnership Agreements, and expanding the network of digital partnerships with Indo-Pacific partners and exploring the possibility of new Digital Partnership Agreements. Strengthen cooperation on research and innovation under 'Horizon Europe'; explore the association to this program of eligible like-minded Indo-Pacific partners such as Australia, Japan, the Republic of Korea, New Zealand, and Singapore. We are stepping up the implementation of the Connectivity Partnerships with Japan and India, supporting partners in establishing an appropriate regulatory environment, and facilitating the mobilization of the necessary funding to improve connectivity between Europe and the Indo-Pacific.

Exploring ways to ensure enhanced naval deployments by the EU Member States to help protect the sea lines of communication and freedom of navigation in the Indo-Pacific while boosting Indo-Pacific partners' capacity to ensure maritime security. Reinforcing support to healthcare systems and pandemic preparedness for the least-developed countries in the Indo-Pacific region, enhancing collaborative research on infectious diseases in the Horizon Europe research program context.

6.5 The US Indo-Pacific Strategy February 2022[66]

The United States will pursue an Indo-Pacific region that is:

1. FREE AND OPEN

Our vital interests and those of our closest partners require a free and open Indo-Pacific, and a free and open Indo-Pacific requires that governments make their own choices and that shared domains are governed lawfully. Our strategy begins with strengthening resilience within individual countries, as we have done in the United States and among them. We will advance a free and open region, including:

- Investing in democratic institutions, a free press, and a vibrant civil society.
- We are improving fiscal transparency in the Indo-Pacific to expose corruption and drive reform.

- Ensuring the region’s seas and skies are governed and used according to international law.
- Advancing common approaches to critical and emerging technologies, the internet, and cyberspace.

2. CONNECTED

A free and open Indo-Pacific can only be achieved if we build collective capacity for a new age. The alliances, organizations, and rules the United States and its partners have helped build must be adapted. We will build collective capacity within and beyond the region, including by:

- Deepening our five regional treaty alliances with Australia, Japan, the Republic of Korea (ROK), the Philippines, and Thailand.
- Strengthening relationships with leading regional partners, including India, Indonesia, Malaysia, Mongolia, New Zealand, Singapore, Taiwan, Vietnam, and the Pacific Islands.
- Contributing to an empowered and unified ASEAN.
- Strengthening the QUAD and delivering on its commitments.
- Supporting India’s continued rise and regional leadership.
- Partnering to build resilience in the Pacific Islands.
- Forging connections between the Indo-Pacific and the Euro-Atlantic.
- Expanding US diplomatic presence in the Indo-Pacific, particularly in Southeast Asia and the Pacific Islands.

3. PROSPEROUS

The prosperity of everyday Americans is linked to the Indo-Pacific. That fact requires investments to encourage innovation, strengthen economic competitiveness, produce good-paying jobs, rebuild supply chains, and expand economic opportunities for middle-class families: 1.5 billion people in the Indo-Pacific will join the global middle class this decade.

We will drive Indo-Pacific prosperity, including by:

Proposing an Indo-Pacific economic framework, through which we will:

- Develop innovative approaches to trade that meet high labor and environmental standards.
- Govern our digital economies and cross-border data flows according to open principles, including through a new digital economy framework.
- Advance resilient and secure supply chains that are diverse, open, and predictable.
- Make shared investments in decarbonization and clean energy.
- Promoting free, fair, and open trade and investment through the Asia-Pacific Economic Cooperation (APEC), including in our 2023 host year.
- Closing the region’s infrastructure gap through Build Back Better World with G7 partners.

4. SECURE

For 75 years, the United States has maintained a strong and consistent defense presence necessary to support regional peace, security, stability, and prosperity. We are extending and modernizing that role and enhancing our capabilities to defend our interests and deter aggression against US territory, allies, and partners. We will bolster Indo-Pacific security, drawing on all instruments of power to prevent aggression and counter coercion, including:

- Advancing integrated deterrence.
- Deepening cooperation and enhancing interoperability with allies and partners.
- Maintaining peace and stability across the Taiwan Strait.
- Innovating to operate in rapidly evolving threat environments, including space, cyberspace, and critical and emerging technology areas.
- Strengthening extended deterrence and coordination with our ROK and Japanese allies and pursuing the complete denuclearization of the Korean Peninsula.
- We are continuing to deliver on AUKUS.
- Expanding US Coast Guard presence and cooperation against other transnational threats.
- Working with Congress to fund the Pacific Deterrence Initiative and the Maritime Security Initiative.

5. RESILIENT

The Indo-Pacific faces significant transnational challenges. Climate change worsens as South Asia's glaciers melt and the Pacific Islands battle existential sea-level rises. The COVID-19 pandemic continues to inflict a painful human and economic toll across the region. Moreover, Indo-Pacific governments grapple with natural disasters, resource scarcity, internal conflict, and governance challenges. These unchecked forces destabilize the region. We will build regional resilience to twenty-first-century transnational threats, including by:

- We are collaborating with allies and partners to develop 2030 and 2050 targets, strategies, plans, and policies consistent with limiting global temperature increase to 1.5 degrees Celsius.
- Reducing regional vulnerability to the impacts of climate change and environmental degradation.
- Ending the COVID-19 pandemic and bolstering global health security.

6.6 Joint Statement of the Leaders of India, Israel, United Arab Emirates, and the United States (I2U2), July 14, 2022 [63]

I2U2 aims to harness the vibrancy of our societies and enterprising spirit to tackle some of the most significant challenges confronting our world, with a particular

focus on joint investments and new initiatives in water, energy, transportation, space, health, and food security. They welcomed the Negev Forum for regional cooperation, which recognizes the unique contributions of each partner country, including Israel's ability to serve as an innovation hub connecting new partners and hemispheres to strategically address challenges that are too great for any one country to manage alone. They discussed innovative ways to ensure longer-term, more diversified food production and food delivery systems that can better manage global food shocks.

Food Security: The UAE—home to the International Renewable Energy Agency (IRENA) and host of COP28 in 2023—will invest USD 2 billion to develop a series of integrated food parks across India that will incorporate state-of-the-art climate-smart technologies to reduce food waste and spoilage, conserve fresh water, and employ renewable energy sources. India will provide suitable land for the project and facilitate farmers' integration into the food parks. US and Israeli private sectors will be invited to lend their expertise and offer innovative solutions contributing to the project's sustainability. These investments will help maximize crop yields and, in turn, help tackle food insecurity in South Asia and the Middle East.

Clean Energy: The I2U2 Group will advance a hybrid renewable energy project in India's Gujarat State consisting of three hundred megawatts (MW) of wind and solar capacity complemented by a battery energy storage system. The US Trade and Development Agency funded a feasibility study for the USD 330 million projects. UAE-based companies are exploring opportunities to serve as critical knowledge and investment partners. Israel and Top, the United States intend to work with the UAE and India to highlight private sector opportunities. Indian companies are keen to participate in this project and contribute to India's goal of achieving 500 GW of non-fossil fuel capacity by 2030. Such projects can make India a global hub for alternate supply chains in the renewable energy sector. They expressed their determination to leverage well-established markets to build more innovative, inclusive, and science-based solutions to enhance food security and sustainable food systems. The leaders also welcomed India's interest in joining the United States, the UAE, and Israel in the.

Agriculture Innovation Mission for Climate Initiative (AIM for Climate).

They affirmed that these are only the first steps in a long-term strategic partnership to promote initiatives and investments that improve the movement of people and goods across hemispheres and increase sustainability and resilience through collaborative science and technology partnerships.

6.7 The Indo-Pacific Strategy of Canada [67]

The Indo-Pacific: A New Horizon of Opportunity and Global Importance of the Indo-Pacific Region

The Indo-Pacific region will play a critical role in shaping Canada's future over the next half-century. Encompassing forty economies, over four billion people, and \$47.19 trillion in economic activity, it is the world's fastest-growing region and home

to six of Canada's top thirteen trading partners. The Indo-Pacific part represents significant opportunities for growing the economy here at home and opportunities for Canadian workers and businesses for decades to come.

The Indo-Pacific is rapidly becoming the global center of economic dynamism and strategic challenge. Every issue that matters to Canadians—national security, economic prosperity, respect for international law, democratic values, public health, protecting our environment, the rights of women and girls, and human rights—will be shaped by the relationships Canada and its allies and partners have with Indo-Pacific countries and to maintain open skies, open trading systems, and open societies, as well as to address climate change effectively, will depend in part on what happens over the next several decades in the Indo-Pacific region (Fig. 44).

The region's economic dynamism and population growth drive demand for education, health services, food, agriculture and fisheries, natural resources and critical minerals, energy, financial services, advanced manufacturing, and green infrastructure. These are all sectors of Canadian strength in which Canada has a global reputation for excellence. In the infrastructure sector alone, an estimated \$2.1 trillion opportunity exists for strategic investments and partnerships in the Indo-Pacific. Seizing these and other strategic opportunities will help safeguard Canada's economic security, build our future prosperity, and help create good, well-paying jobs. Canada welcomes more international students from India than from any other country in the world. These ties enrich our social and economic fabric and make us stronger. Simply put: the rise of the Indo-Pacific can create extraordinary local benefits, increase prosperity, and drive economic growth across Canada (Fig. 45).

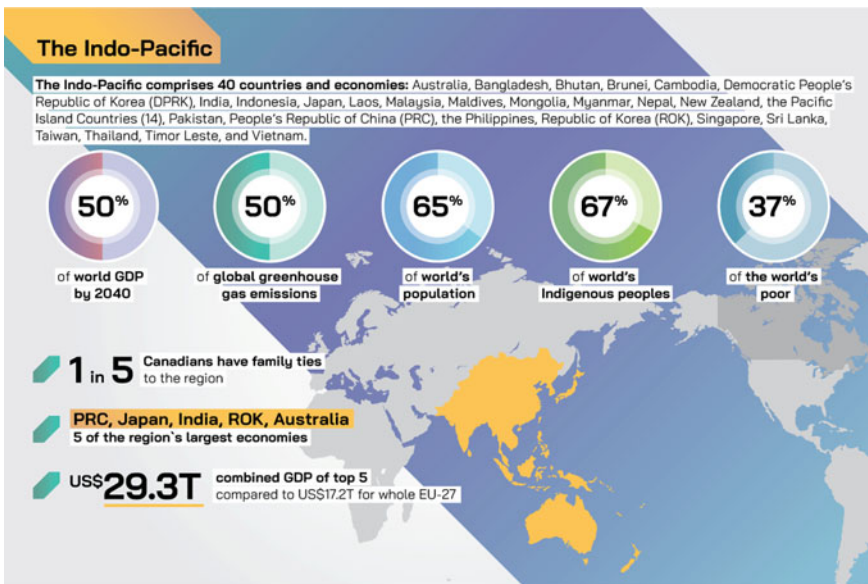


Fig. 44 The Indo-Pacific Canadian perspective. Source [67]



Fig. 45 Canadian Trade Connection with Indo-Pacific. Source [67]

Strategic Challenges

Regional peace and prosperity are threatened by instability on the Korean Peninsula because of North Korean provocations; rising violence in Myanmar following the recent military coup d'état; clashes on the India-China and India-Pakistan borders; escalating tensions in the South and East China Seas and across the Taiwan Strait; and severe poverty and inequality. The Indo-Pacific is home to four states that possess nuclear weapons (China, India, North Korea, and Pakistan). China's assertive pursuit of its economic and security interests, advancement of unilateral claims, foreign interference, and increasingly coercive treatment of other countries and economies have significant implications in the region, Canada, and worldwide. Respect for the sovereignty of other states is a cornerstone of the rules-based international order and of governments' ability to work together to solve shared problems.

The current level of engagements with some significant partners of Canada in the Indo-Pacific is presented below.

The People's Republic of China

At the domestic level, Canada will continue to strengthen the defense of our Canadian infrastructure, democracy, and Canadian citizens against foreign interference. At the bilateral level, Canada will pursue dialogue with China to advance Canada's national interests while remaining true to our values and focusing relentlessly on Canadian priorities. At the regional level, Canada will balance its approach to China with diversified investments in regional relationships and institutions and a strong vision for the country in the Indo-Pacific region. At the multilateral level, Canada will collaborate closely with its partners to face the complex realities of China's global impact and continue to invest in international governance and institutions (Fig. 46).

India

The status of engagement with India is as shown below.

In its engagement with India, Canada will:

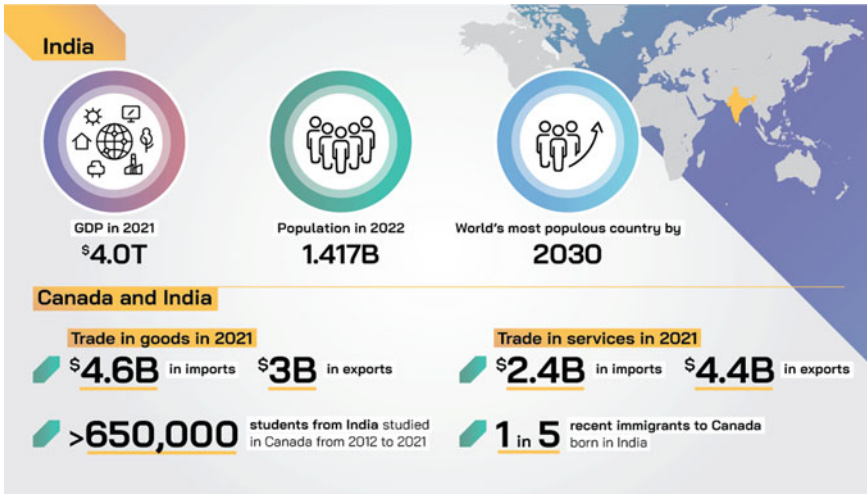


Fig. 46 Canada and India. Source [67]

- grow economic ties, including through deeper trade and investment, as well as cooperate on building resilient supply chains,
- seek to expand market access by concluding an Early Progress Trade Agreement (EPTA) as a step toward a Comprehensive Economic Partnership Agreement,
- create a Canada-India desk within the Trade Commissioner Service to promote the implementation of the EPTA for businesses and investors looking to enter the Indian market or for those partnering with Indian businesses,
- invest in and connect people, including by bolstering Canada's visa-processing capacity in New Delhi and Chandigarh,
- support academic, educational, cultural, Oneth, and research exchanges,
- accelerate cooperation in the fight against climate change, in protecting the environment, and in deploying green technologies,
- send enhanced Team Canada trade missions in priority sectors of mutual interest, such as renewable energy and clean technology.

The North Pacific

The status of engagement with the North Pacific is as presented (Fig. 47).

As Part of Its Indo-Pacific Strategy, Canada Will:

- confirm our relationship with ASEAN at the level of Strategic Partner,
- seek membership in the ASEAN Defense Ministers Meeting Plus (ADMM+) and the East Asia Summit,
- augment our contribution to the ASEAN-Canada Plan of Action Trust Fund, which will direct funding toward the priorities determined by ASEAN,
- seek to negotiate and implement a Canada-ASEAN free trade agreement and a Comprehensive Economic Partnership Agreement with Indonesia,

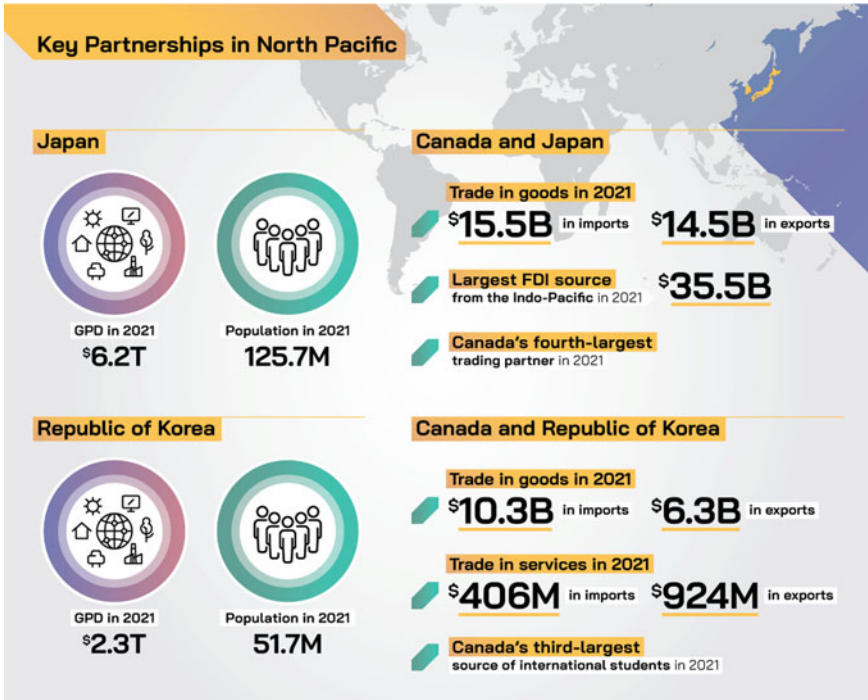


Fig. 47 Canada’s North Pacific Partners. Source [67]

- launch a Canadian Trade Gateway in Southeast Asia as a market entry point and catalyst for Canadian businesses to grow their engagement and presence in the region and enhance Canada’s commercial and investment partner profile. Canada’s Trade Gateway will expand Canadian business and investment networks, linking enterprises to existing incubators and accelerators and increasing their awareness of Indo-Pacific markets, emphasizing sectors and solutions where Canadian innovation responds to regional demand.
- strengthen Canadian diplomatic presence in the region and increase security cooperation with ASEAN and its members,
- continue to recognize and support ASEAN centrality in the region by reinforcing alignment between Canada’s Indo-Pacific Strategy and the ASEAN Outlook on the Indo-Pacific.
- Expanding trade, investment, and supply chain resilience.
- Expand Canada’s trade network at home and abroad; Canada will:
- appoint a new Canadian Indo-Pacific Trade Representative to advance Canada’s regional trade policy, promotion, and economic cooperation objectives in the region,

- launch a new series of large-scale Team Canada trade missions that involve Canadian businesses, provinces and territories, and other relevant partners and organizations; Canada will highlight the capabilities and competitiveness of its exporters and innovators to ensure their success in the region and facilitate long-term trade and investment opportunities,
- provide more significant support for Canadian small and medium-sized enterprises, innovators, and national industry associations pursuing new trade and investment opportunities in the Indo-Pacific through an enhanced and tailored Can Export program,
- support the economic empowerment of Indigenous Peoples through the implementation of the Indigenous Peoples Economic and Trade Cooperation Arrangement (IPETCA) in cooperation with existing partners—Australia, New Zealand, and Taiwan—and Indigenous Peoples from those participating economies,
- provide enhanced support to women entrepreneurs to maximize opportunities in the Indo-Pacific region by expanding international partnerships through the Women Entrepreneurship Strategy,
- open our first Agriculture and Agri-Food Office in the region to help Canadian farmers and producers to diversify their exports and position Canada as a preferred supplier in crucial emerging markets,
- expand the regional mandate of Canada’s development finance institution, FinDev Canada, to the Indo-Pacific. Canada’s commitment to the G7 Partnership for Global Infrastructure and Investment will be done in an approach that looks to amplify, leverage, and collaborate with the Canadian private sector and institutions, like pension funds, should they choose to, on needed small to medium infrastructure projects across the region. This will support high-quality, sustainable infrastructure and provide alternative options for developing economies exploring infrastructure development.

Enhance rules-based trade that provides predictability for economies and exporters, Canada will:

- ensure the Trade Commissioner Service provides expert advice on China’s market while promoting export diversification across the region,
- strengthen Canadian economic security by reinforcing the Investment Canada Act to defend our national interests, oversee more vigorous enforcement, and add more precautions to protect intellectual property and Canadian research continue to collaborate with like-minded partners in the region to counter economic coercion and nonmarket practices,
- collaborate with partners to develop digital infrastructure, promote interoperability, and promote coherent regulations affecting the internet, the digital economy, and trust and security in the use of information and communications technology; this will enhance cooperation on standards, norms, and regulations that will benefit Canada, the Indo-Pacific region and rules-based trade,
- provide more excellent technical assistance to Indo-Pacific trading partners to improve the enforcement of labor provisions, including on forced labor, in current and future free trade agreements with Canada; this will help protect workers’

rights, ensure companies are respecting human rights in their supply chains and contribute to leveling the playing field for Canadian workers and employers,

- To ensure the resilience of supply chains, Canada will:
- continue to make significant investments in domestic transportation infrastructure projects through the National Trade Corridors Fund, such as investments in the ports of Vancouver and Prince Rupert, for substantial upgrades to Canada’s marine, port, airport, road, and rail infrastructure, increasing national trading capacity, fluidity, and efficiency,
- advance shared interests in supply chain resilience with partners, including through greater Canadian involvement and alignment with regional initiatives, such as the Australia-Japan-India Supply Chain Resilience Initiative,
- contribute to global supply chain resilience and sustainability by engaging in technical, policy, and high-level cooperation through APEC on standards, conformity assessment procedures, and best practices to enhance trade,
- position Canada to be a dependable supplier of clean energy in the region—and in a net-zero emissions economy—including critical minerals and hydrogen, to fight climate change, be an energy security partner, and support global climate goals,
- expand natural resource ties—related to trade, investment and science, technology, and innovation—with priority Indo-Pacific partners,
- strengthen Canada’s Science, Technology, and Innovation partnerships with key economies, including Japan, the Republic of Korea, India, Singapore, and Taiwan, to support international coinnovation projects and commercialization-oriented research and development partnerships for Canadian small and medium-sized businesses with Indo-Pacific partners,

Increase export diversification and free trade access, Canada will:

- collaborate with partners to strengthen and expand the CPTPP and ensure that any form of expansion will be based on lofty standards and histories,
- seek to join and meaningfully contribute to the newly established Indo-Pacific Economic Framework for Prosperity,
- improve market access through new comprehensive free trade agreements, such as those currently being negotiated with ASEAN, India, and Indonesia, and on new or modernized Foreign Investment Promotion and Protection Agreements,
- join the Digital Economic Partnership Agreement with Singapore, New Zealand, and Chile while securing a cultural-industries exception for the Canadian cultural sector.

Strengthen people-to-people exchanges, Canada will:

- bolster visa-processing capacities in critical locations in the region to ease access for students and family members; this initiative will enhance visa-processing capacity within Canada’s centralized network, as well as abroad in New Delhi and Chandigarh, India; Islamabad, Pakistan; and Manila, Philippines; these new

resources will support ongoing efforts to accommodate the high volume of temporary resident visa applications (including visas, study permits and work permits) from the region,

- facilitate travel to and from the region to strengthen people-to-people ties and bolster tourism by using different tools, such as the new and modernized Air Transport Agreements, and explore options to facilitate travel further, making trips to Canada more accessible, faster, and safer for everyone,
- leverage its reputation as a top education destination by launching over 1,000 scholarship and fellowship opportunities for Canadian students and students from ASEAN countries,
- strengthen Canada's international student program with permanent residence and job opportunities for students from the Indo-Pacific that could lead to staying in Canada to contribute to Canada's future; these investments will attract highly skilled workers to Canada to meet the needs of our economy today and into the future,
- ensure that under the Indo-Pacific Regional Engagement Initiative, a broad range of Canadian sector leaders, subject-matter experts, academics, and civil society groups will be able to build new networks in the Indo-Pacific, strengthen the Canadian voice on priority issues and create partnerships on behalf of Canada invite over 200 Canadian experts to go to the region to support countries that seek to partner with Canada in tackling challenges where Canada has the expertise, such as in governance, energy transition and oceans management,
- foster greater inclusion of Canadian diaspora communities of Indo-Pacific heritage through expanded cultural initiatives,
- fight against anti-Asian racism in Canada, in all its forms, through the full implementation of the federal Anti-Racism Strategy,
- pursue the path of reconciliation with First Nations, Inuit, and Métis Peoples through enhanced Indigenous exchanges with regional partners, such as Australia, New Zealand, and Taiwan; support education and skills development for Indigenous Oneth; continue the implementation of the IPETCA and support the performance of the UN Declaration on the Rights of Indigenous

Peoples

- support francophone immigration objectives by expanding our diversification efforts in Cambodia, Laos, and Vietnam—home to 1.3 million French speakers,
- Strengthen our international assistance, Canada will:
- deepen partnerships in the region by increasing feminist international assistance programming based on partner needs; Canada will help to protect the most vulnerable populations and support work from achieving the Sustainable Development Goals,
 - support efforts toward democracy, inclusivity, accountable governance, and sustained economic growth, helping critical countries in the region,

- work with development partners in the region to reduce inequality and contribute to their economic prosperity,
- continue to provide critical humanitarian assistance, especially in times of crisis, such as the recent floods in Pakistan,
- establish our first international assistance program for the Pacific Islands region, supported by our membership in, and support for, the Partners in the Blue Pacific,
- support Canadian civil society organizations through targeted initiatives that will enable them to pursue human rights and gender equality projects in the Indo-Pacific and bolster partnerships with their regional counterparts,
- help build demining capacity by establishing standards for landmine clearance and accelerate mine clearing by sharing expertise to support personnel, especially women, engaged in demining activities in Laos and Cambodia.

Defend and enforce human rights, Canada will:

- strengthen dedicated Canadian funding and advocacy to support human rights across the Indo-Pacific, including for women and girls, religious minorities, 2SLGBTQI + persons, and persons with disabilities,
- leverage Canada's leadership in multilateral institutions to support regional action on human rights,
- work to counter forms of arbitrary detention by hosting a summit on arbitrary detention in 2023,
- fully implement the next phase of Canada's Rohingya Strategy,
- support peacebuilding in Sri Lanka and Myanmar and encourage truth-seeking and accountability for alleged violations of human rights and humanitarian law during the civil conflict in Sri Lanka.

Building a Sustainable and green future

Support the region in building a sustainable and green future, Canada will:

- expand the capacity for FinDev Canada to support high-quality, sustainable infrastructure in the Indo-Pacific and provide alternative options to developing economies exploring infrastructure development,
- support oceans management initiatives and expand measures against illegal, unreported, and unregulated fishing in the Indo-Pacific, including through our Dark Vessel Detection Program, which uses Canadian technology to find illegal fishing vessels and protect fish stocks,
- establish a signature initiative in the region on disaster risk and resilience that enables Canada to share expertise and help countries adapt to, and be ready for, the impacts of climate-induced disasters before, during, and after disasters strike,
- boost commercial demonstration of clean Canadian technology in priority Indo-Pacific markets and help Canada's clean technology small and medium-sized enterprises with financial support to break into markets in the region,
- build on the already allocated \$1.26 billion out of the Canada Climate Finance Commitment toward the Indo-Pacific region to assist partner countries with

economic recovery and infrastructure needs and catalyze inclusive and sustainable development through Canadian capital, technology, and policy expertise,

- prioritize the Indo-Pacific region as part of the Powering Past Coal Alliance, which is working to help partners advance their transition from unabated coal power generation to clean energy; will collaborate with partners in the region to support a change to cleaner energy²² Canada's Indo-Pacific Strategy,
- ensure Canada's international assistance program will target climate and environmental action, with the most significant impact based on needs defined locally and related to climate change, energy transition, biodiversity, and oceans management,
- work with Indo-Pacific countries to prevent plastic pollution from entering the oceans and the environment, reduce plastic waste, and better manage existing plastic resources, including by supporting an ambitious, legally binding global agreement to end plastic pollution that addresses the entire lifecycle of plastics,
- advance Canada's Global Carbon Pricing Challenge to share expertise on carbon pollution pricing as a valuable tool to fight climate change and drive investment in clean technologies.

Canada is an active and engaged partner in the Indo-Pacific. Canada's overarching priority is to be an active, dynamic, and dependable partner. Canada will build influence among our regional partners and allies by increasing our diplomatic engagement, forging connections between like-minded countries, and collaborating on common causes. Canada is expanding and deepening its political, economic, and security partnerships through sustained investment and engagement at the highest levels. It is also sustainable development assistance and cultural footprint throughout the Indo-Pacific. Defending the rules-based international order in the Indo-Pacific requires a dynamic approach to Canadian diplomacy and engagement. Canada will pursue its cooperation as it always has as a friend and partner committed to mutual respect; as a proudly diverse country; and as a champion of multilateralism motivated by the idea that our future security and prosperity are best served when all nations—large and small—abide by global and regional rules. Canada's Indo-Pacific Strategy continues our long tradition of international and regional commitments tailored to meet the needs of our regional allies and partners.

Become a more active and engaged partner in the Indo-Pacific, Canada will:

- appoint a special envoy for the Indo-Pacific region to coordinate a whole-of-government approach and manage the strategic implementation of the strategy,
- recognizing ASEAN's centrality in the region, confirm and advance our relationship with ASEAN to the level of Strategic Partner,
- seek membership in the ADMM + and the East Asia Summit,
- increase Canada's diplomatic presence and engagement in the region through more frequent high-level travel, more diplomatic representation, and deepening engagement in regional groupings,
- strengthen engagement with the Pacific Islands Countries by opening Canada's first mission to Fiji, committing to increased ministerial-level representation at the

meetings of the Pacific Islands Forum, and contributing concretely as a member of the Partners in the Blue Pacific initiative,

- continue to grow its economic and people-to-people ties with Taiwan while supporting its resilience,
- deploy Canada’s first diplomatic position in Hawaii to lead engagement with local US and international partners²³ Canada’s Indo-Pacific Strategy,
- bolster the Asia–Pacific Foundation of Canada’s engagement in the region by opening an office in the area and through a new range of activities, including seminars, events, and research programming related to the Indo-Pacific,
- hold inaugural Canada–United States Strategic Dialogue on the Indo-Pacific in 2023,
- increase Canada’s presence—supporting analysis, consultation, and diplomacy related to China— at Canada’s multilateral missions to the United Nations, the European Union in Brussels, and NATO, to anticipate and respond to political, economic, and security trends.

7 Conclusions

7.1 *Configuration of the Megacity System in the Indo-Pacific*

The G7, G8, and G20 Countries are the largest economies in the world and the strongest in terms of military and defense capabilities. Both are equally important for regional development. They are the countries that develop the latest and emerging innovative technologies with the potential to transform work and life and can become their market leaders. They are also a depository of the world Megacity system of megacities and the Indo-Pacific megacity system of twenty-one megacities discussed earlier. They are represented in the diagram below by their national flags (Fig. 48).

France, Germany, the UK, Japan, Canada, the European Union, Australia, India, and the United States are either members of the QUAD group of countries or have their independent policies, programs, and proposals in the Indo-Pacific with sizeable and recently strengthened diplomatic presence there in the Indo-Pacific and fully ready for collaborative action with strategies, Administrative Protocols, and budgets. Although not active now, Italy is open to East Asia and maritime defense cooperation. Among the G20 Countries, India, Australia, Indonesia, China, South Korea, and the European Union are present in the Indo-Pacific either as QUAD members or with independent country policies, programs, and investment proposals and presence. China and Russia are against any NATO-like defense cooperation of QUAD, while it is not the terms of reference of QUAD. All world systems of megacities and Indo-Pacific megacity systems are part of these countries articulating their economic potential.



Fig. 48 G7, G8, and G20 Country Grouping

Argentina, Brazil, and South Africa can be a potential grouping of countries with the US or India. It can form the third QUAD after the UAE, Israel, USA, and India QUAD 2 and the US, Japan, Australia, and India the QUAD 1 or QUAD.

It can be observed that no attempt is made to form an independent QUAD organization with headquarters and branches, as in the case of the United Nations or SARC. At the same time, all countries are committed to long-range cooperation. The QUAD uses its country bureaucracy efficiently and with no duplication of effort and expert working groups independently or jointly as it develops for QUAD programs formulation of implementation and uses the available bureaucracy and private parties as deemed most suitable and efficient for speedy and efficient performance, for the Governance of QUAD based on their programs. The programs are made in consultations with QUAD core member countries and mutually agreed upon by governments who wish to join. The sovereignty of the nations is fully respected. The multipolar world as against the world of superpowers was recognized, and countries can join fully or partially in any QUAD program of action.

Once the country joins the QUAD programs, the barriers between people and distant international and multi-country QUAD must be broken. This can be executed if research and development are conducted and arrive at a detailed design of such Smart Global Economic Communities in the Indo-Pacific. This is decided as the follow-up of this research program, with an outcome expected in 2024 regarding books published.

7.2 *Megacity System is in the Indo-Pacific Region*

The Indo-Pacific region is modeled (which is a simplification of reality) as a system of twenty-one-plus megacities. This system sustains by constant flows of humans, goods and services, and communication; money flows exhibiting mutual dependencies due to interactions. This system includes all dependent countries, megacity subregions, and other dependent city systems.

Administratively, megacities spread to one or more Federal states, such as National Capital Region in Delhi, or districts as many as five sections in Kochi Kannur megacity in Kerala, which is seldom a Union Territory. Megacities have their subregions and zones of influence based on daily interaction and interdependencies within the national locations of these megacities. The landlocked countries outside megacities use the megacities' gateway infrastructure and related institutions for their economic activities.

Megacities deceptively seem to have grown historically as standalone and independent giant conurbations as an economic superpower among a hierarchy of cities, forgetting other megacities in the system. They are neither independent nor standalone cities. It has a local and international economy based on the types of economic interactions. Megacities themselves are interlinked with each other megacities functionally for a variety of higher-order economic, social, cultural, and ecological interactions with wide-ranging spatial impact beyond these cities, creating an integrated Indo-Pacific region increasingly. It had impacted the life and working of the inhabitants, contributed to more extraordinary human accomplishments, and valued destinations for immigration.

As such megacities, the generator of economic superpower demands an uninterrupted daily flow of non-polluted air and water, assured protection of their territories and loss of valuable urban land from the rise of the sea due to climate change, potable water, perennial and reliable energy supply, perishable and nonperishable food, a perennial source of increasing income, and expenditure to households, all types of utilities and services of highest standards, and essential other supplies to survive. For that, they depend on all human settlements below the megacity hierarchy. It should provide work to earn an adequate income to survive honorably in a competitive environment affording a high standard of living within a high land value megacity, commensurate with a higher income than other cities. Suppose One computes the total expenditure to sustain the megacities. In that case, One can find private households and non-government-owned entities in megacities spend a disproportionately higher share of payment than the government. Still, Governance is given a higher set of overriding power by the country's constitution to protect all rights.

Because of all the above factors, megacities are overly complex. In many cases, external factors beyond the national boundary and their external interaction had a more significant say in megacity development. At the same time, internal economic activities make them sustainable by providing a large market of ten million or above population in a limited geographic area for easy market access due to higher megacity densities.

A megacity can be considered a complex of overlapping spatial systems and involves many systems within. For example, energy, water and sewerage, food, transport, health, education, biodiversity, and side-by-side ecological, economic, social, and cultural systems connect one area to another. This complex network of systems, interconnections, and flows can be described as a megacity system of systems. Many of these system components originate from outside the hierarchy of administrative regions. The city cannot politically and administratively influence the system environment's unpredictability, such as war, natural disasters, terrorism, climate change, economic recession, or other primary medium or minor ecological collapses. These eventualities point toward a crucial role of integrated megacity system planning, management, and development to design transcending national boundaries. As events unfold, the megacity system demands higher adaptability and resilience for sustaining a significant population of ten million and above.

Indo-Pacific and QUAD came up in 2004 spontaneously as a response to the Tsunami by a group of countries who helped others, and themselves make all systems stable and sustainable in as limited time as possible in many countries, sharing what they best have to the situation. The world has faced many uncertainties in the past. The Indo-Pacific megacity system consisting of twenty-one megacities and the connected region as the highest repository of human capabilities, financial powers, superior infrastructure, knowledge, skills, and related higher-level institutions, has an essential and confident role in finding remedies for maladies for these uncertainties of natural disasters like tsunamis, earthquakes, floods, and the effects of climatic changes and even economic recession or collapse of National economy like that of Sri Lanka. Megacity systems collectively have a role in helping those affected by these calamities. There are also manufactured calamities like war which can be avoided by dialogue and diplomacy. The spread effect of economic sanctions affects more people in more countries in a connected world who may not be directly involved in the conflict and drives them to food and energy scarcity or scarcity of medicines and equipment, for example, faced during the pandemic COVID-19 or natural disasters or Ukraine war. The solution is to identify many alternatives before the event that impacts supply chains so that these alternatives can substitute for the scarcity and even recessions that can come in. These megacities could identify scenarios of issues and alternate remedies as a joint effort of money, skills, and institutional capabilities of many megacities systems together transcending nations.

7.3 The Economic Strength of Indo-Pacific Megacity System

The two goals of the Indo-Pacific are peace and prosperity. Peace is an absence of war and conflict with the commitment of all countries to a rule-based order. A peaceful and stable megacity system ensures prosperity with no downward and unpredictable fluctuations in income and expenditure.

Like many countries in the Indo-Pacific, India, with around one-third population living in cities a GDP urban share, is about seventy percent. With the increase in the

size of the cities, GDP share increases. Hence, megacities' share of GDP is always higher than small cities, including metropolises, even though the total population in megacities is around 8 to 9 percent. With Dhaka, as an example, the only megacity in Bangladesh, its share in GDP is as high as 60 percent of the National GDP, and Cairo is about 50 percent on the higher side but in India, with seven to eight megacities. The individual share is much lesser and evenly distributed to less than 10 to 16 percent but unevenly spatially distributed, with most of them in the West and the South part of India, while in China, it is primarily the eastern part leaving the western part less developed in China and the east part in India. It looks like subregions of megacities are more developed than other regions where access to megacities is limited, so economic opportunities and development of these subregions. Once the GDP of all twenty-one megacities in Indo-Pacific is combined, the percentage of the GDP of Indo-Pacific could be much higher than the rest of the region. It is also seen that a higher GDP share of the megacity means more significant opportunities for higher achievements, creating a situation in which other indicators of human development tend to be higher side by side, as illustrated by Bangladesh, where the secret of high achievements is hidden.

Human resources must be highly accomplished and competitive to realize an aspiration of good living in megacities. For them, high-paying work must be available continuously in megacities. Enhanced living is demanded with increasing income, and the megacity shall provide it. A perennial generation and flow of new knowledge and innovation for all economic, social, and cultural activities are the basis of the megacity system's sustenance. Such knowledge can be shared if the megacity collaborates, transcending national boundaries. Megacities can self-organize through self-organized supply chains for all of the above.

7.4 Sharing Economy, Platform Economy, and Indo-Pacific Megacity System

A megacity system is a group of megacities that, in their evolution, have become interdependent because of the many relationship networks that interconnect them to a greater extent than other less populated cities elsewhere. The air, sea, rail, road, broadband, and internet communication connection enables money flow and, in return, commodities, technologies, innovative ideas, design innovations in products and services, other services, and people flow to connect all megacities for economic interaction. E-Commerce, for example, Amazon, a global exporting entity for many countries, makes small sellers with minimal capital and income who can never be conventional shopkeepers become international sellers exporting their wares, using the megacity system and other services such as logistics, accounting, and legal services and sharing at the same time the technologically advanced e-commerce infrastructure platform of Amazon.

So, sharing the common digital platform becomes critical to megacity system economic development such as e-commerce. Just like an e-commerce platform with all its specialized algorithms and routines that move products to consumers' destinations from different origins selected in such a way that minimizes the time of delivery from purchase time, makes payment and makes refunds, and connects megacity for commercial activities. Machine-to-Machine (M2M) systems enabled platforms for supply chain component productions for many households and small and medium industries sharing common electronic platforms. Machine-to-Machine (M2M) systems in the megacity system can be made into self-organized platforms to develop complex manufacturing supply chains and related algorithms in many megacities subjected to resilience under shocks. This can be for defense supplies or civil supplies. A similar platform can be there for service economies of diverse types in a megacity system. We must integrate e-commerce and e-production using M2M, generally a platform in a megacity system in an integration spatially executed with logical algorithm run decision making any time on any day. Once it is achieved, e-commerce and M2M production systems are well integrated with a megacity system is the basis of megacity systems as engines of economic growth and economic, social, and ecological development. This, in short, is the platform economy of the megacity system.

As indicated, twenty-one megacities exist in the Indo-Pacific out of thirty-three in the universe. We have an integrated megacity system once these megacities are interconnected along with e-commerce and spatially scattered M2M small and medium industries network for production with the 21-megacity system. Suppose One brings all of them into one electronic platform and generates different scenarios for the Indo-Pacific policies of countries such as France, the European Union, Japan, and India. In that case, we have a megacity development framework for the Indo-Pacific. The same system can answer supply chains of production and commerce when unanticipated events like sanctions following the Ukraine wars precipitate. This is the challenge of the megacity system before the knowledge community.

Heterogeneity of megacity system Governance is given, and the author is a proud Hindu who believes in extreme and uncompromised tolerance of Hinduism and Buddhism. So, we have autocracy as a governance mechanism for Chinese or Russian megacities in Indo-Pacific and democracy for many others in the Indo-Pacific such as India, Japan, Indonesia, and many others. There can be a mixture of the two, overriding power with the President in a democracy such as Sri Lanka. The rights of citizens vary as per the country's constitution. The constitutional interpretation of Freedom also differs from one country's constitution to others. Platform economy works differently in these systems followed.

The primary beneficiary of components of the platform economy in the megacity system is people below the poverty level, which effectively connects the Government to People by direct money transfer to their bank accounts when they are distressed or face calamities, making them easy to get bank accounts from Aadhar cards which is another internet platform. A man with one taxi car shares it and works with Uber on another mobility platform. A stay-at-home spouse from a lower middle class

becomes an entrepreneur in e-commerce with Flipkart or Amazon. So also, a small-scale industrial establishment, however small it may be, participating in a feature-rich platform economy and benefits. These are all examples of the sharing economy of intelligent cities. Without a platform economy and high megacity infrastructure, the rapid transition of the low-income group to the middle-income group and the rich to the super-rich in the megacity system is not possible for several reasons.

We get an open commerce network if all digital e-commerce platforms of different companies are connected inclusively with all commercial establishments outside it. Similar networks are possible for logistics, other services related to health and education and military production, and services and industrial output on open networks. This is more akin to a spatial system than an isolated company e-commerce system in a city. Spatial systems, unlike e-commerce firms, do not exclude outsiders.

This is the age of sanctions where, in addition to the United Nations, which gives out binding sanctions, we have non-binding sanctions from the US, European Union, NATO countries, and many others. Like autocracy and democracy co-exist in the megacity system, the UN and other countries' sanctions co-exist. While urban systems under Autocracy and Democracy do not change instantly, the sanctions triggered by war or trade war can change urban systems. The platform technology and economy behind e-commerce and M2M production systems of supply chains to megacity systems need to be fine-tuned as such sanction event unfolds a set of predesigned different supply chains are enabled to circumvent food, medicine, and energy scarcity that results and to avoid recession from sanctions and to avoid creating more people below poverty level in the third country that is not involved in sanctions. Only a platform-based megacity system can perform and incorporate instantly unexpected events and calamities since it is part of Governing responsibilities. Although it is yet to be worked out by the megacity system of Indo-Pacific, it is a feasible option for Think Tanks to work out. Here, for example, government and private e-commerce and M2M production systems shall come under one megacity system to overcome the impact of such unexpected and shocking eventualities. The country's policies and initiatives direct it from time to time. If the country follows strategic autonomy for defense and economy and is non-aligned, it has more freedom than other countries under alliances.

Here system theory is the basis. Systems theory, the base of the platform economy, is the interdisciplinary study of systems, i.e., cohesive groups of interrelated, interdependent parts that can be natural or human-made. Every design is bounded by space and time, influenced by its environment, defined by its structure and purpose, and expressed through its functioning.

One of the noteworthy aspects of Indo-Pacific is that there are four leading countries, the US, Japan, Australia, and India, and their willingness to collaborate with all countries of the Indo-Pacific as well as outsiders such as the European Union, UK, Germany, Netherlands, Canada, and France, all of them having their Indo-Pacific strategies and willing to be partners in the prosperity of the Indo-Pacific. They all have a genuine interest economically in these regions as a legacy of long historical connections of these countries in the area.

The Indo-Pacific Megacity system starts with the concept put forward as an interdependent region with common goals arising out of shared issues and a unified search for effective and outcome-oriented solutions with the participation of countries as per their capabilities using advanced technologies. The Indo-Pacific was, earlier at its inception, a spontaneous mental creation for disaster management when countries collaborated as if they were one family. These need to be extended to all eventualities in the region, the impact of war, the aftermath of a fight against opponents, sanctions, and countersanctions. The additional dimension is that the Indo-Pacific part can be a global focal area of the twenty-first century for regional economic development based on integrating the megacity system and standardized adoption of emerging technologies. All Indo-Pacific countries have infrastructure and protocol of action once a Tsunami happens and other calamities or Pandemic COVID-19 happens in Indo-Pacific. They can instantly generate alternative supply chains to face unanticipated disruptions, for face masks for COVID-19 prevention and shortage of food and energy in various other situations. All of them have economic, environmental, and social impacts. The modified and adapted supply system for any eventuality generation can be designed in advance, and preparations for necessary action can be put in place jointly by the megacity system, which can be immediate or run into many years and months and operationalized. While the e-commerce system and M2M system looks at only fulfilling the demands for the commercial product within the company, the megacity system looks at holistically as an open network of the global digital economy, all aspect of living and working and its environmental impact in all unexpected eventualities to make the megacity system sustainable and resilient within a brief time to overcome difficulties with collaborative country actions.

7.5 How Indo-Pacific Integrated Regional Development Through Megacity System is Functioning

We know how these systems we discussed above can work through various case studies in my edited books on the smart city series we jointly researched and authored by academics from Africa, Asia, Europe, the Middle East, and North America, such as,

- I. Smart Economy in smart cities [55]
- II. Smart Metropolitan Regional Development [67]
- III. E-Democracy for Smart Cities [68]
- IV. E-Governance for Smart Cities [69]
- V. Smart Global Megacities Two volume [70, 71]
- VI. Smart Environment for Smart Cities [72]
- VII. Smart Living for Smart Cities Two books [73, 74]
- VIII. Smart Master Planning for Cities Case Studies of Domain and Digital Innovations and Case Studies Two Volume [75, 76].

In addition, we know the following.

- a. There is a movement of money, information, people, and goods and services between all twenty-one and above megacities in the Indo-Pacific, and this system functions every millisecond.
- b. This system exists because of thousands of island chains, about forty countries in East Africa, Asia, the Middle East, ASEAN, and SARC countries. Twenty-or more megacities solely depend on Integrated Regional Development and Integrated Disaster management and one joint fight against environmental and pandemic calamities such as COVID-19, Tsunami, earthquakes, and disappearance of island chains due to sea rise of Indo-Pacific for climate change. These are all existential threats where an integrated regional solution alone is possible. Individual countries cannot solve these issues independently.
- c. Smart City technologies are the building blocks of the Indo-Pacific Regional Development. All cities are the smart city in evolution and intelligent global megacity systems, such as ICT, IoT, Machine-to-Machine systems, Industry 4, 5G, and 6G applications in Industry 4, Intelligent cloud, and the blockchain. Fintech, e-commerce, and e-governance are there. Some are widely used, for example, for direct debit of cash to Bank accounts during distress and disasters circumventing the cumbersome and corruption-ridden bureaucracy, which amounts to several billion dollars in India, and easiness of people experiencing poverty to open bank accounts in India using Aadhar cards and widespread use of Unified Payment Interface UPI of India in Nepal, Singapore, UAE, Bhutan, Australia, and more countries to follow.
- d. We know that existing urban land use planning starting from the land-use classification that exists today, is out of date and irrelevant when ICT, IoT, and M2M enabled Smart Cities to evolve in the Indo-Pacific because its past foundation is monoculture land use which needs to be mixed land use totally and everywhere with limited dependence on even emerging environment friendly and individually owned electric Cars since workplaces are distributed in all mixed land use starting from home and then inexpensive local community shared faculties in walking distance. Some land uses and establishments such as bank branches or administrative buildings, for example, can be eliminated by being replaced by UPI or its evolutionary all-compassing systems of future Banking under experimentation once the development of E-Governance, E-Democracy, Smart Mobility, E-Commerce, M2M production system, and Home-based work culture a product of the post-COVID-19 era has also made these redundant. COVID-19, with a compulsory “work@home” culture of Intel and Apple computer industries, was the most productive year for Intel and Apple when the 12th generation chip came up much faster than usual. Apple computers came out with an M1 chip and moved toward M2, and high-powered, compact, and less energy-consuming Apple studio-type computers came up. Brick and Mortar Bank is irrelevant for Fintech end users, Mall is outside for e-commerce users, factories are unrelated for M2M users in production, and twentieth-century organization that houses in one location in many buildings are also out of date for Indo-Pacific based on emerging technologies. This land-use classification and zonal regulations must change.

- a. Megacity system future in the Indo-Pacific is emerging technologically dependent and unpredictable. So if there is a Management and Plan for the development of the Indo-Pacific, it must be a three- to five-year long-range perspective plan and annual plans and planning. An implementation time delay may be reduced to milliseconds using smart technologies such as IoT and M2M systems.
- b. With fast progressing full ownership of smartphones in megacity systems with high bandwidth and 5G, smartphone enabled and internet-based platform for planning, management, and implementation as practiced in the Fintech, e-commerce, e-democracy, e-governance, M2M in Industry 4, Uber Taxi service shall be the backbone of Indo-Pacific Megacity System for Regional Development.
- c. How we work, live, and govern in the Indo-Pacific must change once they accept advanced technologies.

What are the ways and means for achieving Indo-Pacific Integrated Regional Development through Megacity System?

- a. Accept that every institution, government and non-government, goes through a life cycle of birth, growth, and death like all living entities, just like industrial products, the nature of ever-changing services and commerce sectors. This is an opportunity to regenerate and reform using emerging technologies. Then rebuild institutions by accepting the reshaping of these institutions using ICT, IoT, M2M, 5G, 6G, Industry 4, and all emerging technologies.
- b. Organize innovative community internet-based spatially and highly specialized and non-spatial communities for work involving primary, secondary, and tertiary sectors using emerging technologies with consequent enhanced smart living and appreciable enhancement with E-Democracy in living.
- c. Smart communities shall embrace Sharing economy in all walks of work and life instead of a capitalist-owning economy.
- d. Analyze and redesign all economic activities and then reconfigure them using broadband internet and advanced emerging technologies to increase value addition and internal rate of return.
- e. Renewables shall be part of life starting with energy, and combining production with renewable can reach production and service delivery with a near-zero marginal cost for long-range sustainability.
- f. Increase production and distribution of relevant, high-quality knowledge workers from academic institutions to meet the development needs and make it easy to access their work opportunities in the Indo-Pacific, removing barriers.
- g. Achieve an exceedingly elevated level of easiness to access government services and continuously evaluate governance by satisfaction scores of services by consumers and reform through e-democracy combined with e-governance and not only simply conforming administrative rules of law.
- h. Spatial implications of all the above shall be part of the megacity system's integrated development and the Indo-Pacific's regional development.

- i. Develop continuously Smart and technologically Up-to-Date Production systems for end-user supply chains in the megacity system's primary, secondary, and tertiary economic activities. The fundamental steps of a supply chain in order are Sourcing raw materials, refining those materials into essential parts, combining those basic parts to create a product, order fulfillment for sales, product delivery, customer support, and return services. These can be dispersed spatially. The time it takes for any of these processes from start to completion is known as lead time, and using algorithms reduces it. The spatial and infrastructure requirements shall be accounted for.

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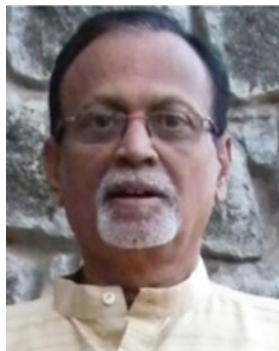
customer support, and return services. These can be dispersed spatially—the amount of time it takes for. Any of these processes from start to completion is known as lead time, and using algorithms reduces it. The spatial and infrastructure requirements shall be accounted for.

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