



Understanding Issues of Geopolitics Economy and Stability for Development



A Proceeding of A Symposium
on
Understanding Issues of Geopolitics
Economy and Stability for Development

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This proceeding book is the outcome of the symposium organized by Neeti Anusandhan Pratishthan, Nepal (NeNAP) on 26th Jestha 2081 (8th June 2024) at Kathmandu, Nepal. In the context of two rising economic giant powers, i.e., Nepal's neighbouring countries and the influence of other development partners and stakeholders, the symposium aimed to bring forth the challenges and foster understanding geopolitics, economic stability and development opportunities in infrastructure, and overall economic growth.

The speakers and paper presenters at the symposium had critically analyzed the contemporary geopolitical landscape and its possible impact on small countries like Nepal. Geopolitical scenarios shaped by the Millennium Challenge Corporation (MCC) of the United States of America (USA) and the Belt and Road Initiative (BRI) of China, the impact of climate change on development, geopolitics in the digital era, and trade and economic development were the major issues of concern and discussion in the symposium.

Renowned businessmen, political figures, legislators, policymakers, academics, government officials, the private sector representatives, members of the National Planning Commission of Nepal, researchers, journalists, and intellectuals were all present at the programme. It proved to be quite beneficial as it highlighted the real-world opportunities and challenges that the Nepalese government and policymakers need to address.

We express our sincere gratitude to all the participants, journalists, and paper presenters for making the programme a grand success. Your contributions have been invaluable in fostering a spirit of cooperation and shared learning. Together, we can build a brighter future that prioritizes both economic growth, infrastructural development, and environmental stewardship. As we move forward, we are committed to continuing these important dialogues and encouraging greater engagement from all sectors of Nepalese society.

Thank you.

Keshav Raj Panthee, PhD
Executive Director
Neeti Anusandhan Pratishthan, Nepal (NeNAP)

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Introduction

Infrastructure development plays a vital role in societal progress and economic prosperity. It serves as the framework upon which nations build their future, facilitating essential services, enabling economic activity, and enhancing overall quality of life. The significance of infrastructure development encompasses a multitude of dimensions, each contributing to the advancement and well-being of societies worldwide. In recent years, major infrastructure projects have become central to economic development strategies worldwide and has also become a matter of geo-political interest. These projects, ranging from transportation networks to energy systems, have the potential to stimulate economic growth, enhance competitiveness, and improve living standards. However, the economic viability of these projects and their implications for socio-economic stability are subjects that warrant careful examination. The experiences of several developing countries, in recent times, have highlighted significant challenges and negative consequences associated with large infrastructure projects. These challenges often manifest in the form of debt crises, environmental degradation, and social displacement. So, international assistance such as Millennium Challenge Corporation (MCC) of USA and recently launched Belt and Road Initiative (BRI) of China has and had become hot topic of discussion in developing and developed countries.

Nepal, a country with diverse geography and rich cultural heritage, is undergoing rapid urbanization and economic development. Like other developing countries, it has also identified major infrastructure projects as crucial drivers of growth. However, the economic viability of these projects and their implications for socio-economic stability are subjects that warrant careful examination. Understanding the interplay between infrastructure investments and socio-economic stability is crucial for policymakers, investors, and communities alike. In this context, Neeti Anusandhan Pratishtan, Nepal (NeNAP) had organized a day long symposium on “**Understanding Issues of Geopolitics, Economy and Stability for Development**”. The symposium aimed to provide a platform for stakeholders to examine the economic viability of major infrastructure projects and explore their implications for socioeconomic stability in Nepal. By bringing together experts from academia, industry, and government, the symposium was successful to foster dialogue, share insights, and identify best practices for promoting sustainable infrastructure development, tackle geo-political influence as well as planning for overall development of Nepal.

Specifically, the symposium had addressed the following contents:

- Financial feasibility and investment attractiveness of major infrastructure projects in Nepal, including transportation, energy, and telecommunications.
- Funding mechanisms, financing options, and investment incentives available for infrastructure development in Nepal.
- Nature of foreign aids and loans.
- Socio-economic implications of major ongoing and anticipated infrastructure projects (MCC, BRI and others) on Nepalese communities, including employment generation, income distribution, and poverty reduction.
- Social and environmental externalities associated with infrastructure and technological development in Nepal and strategies to mitigate adverse impacts on vulnerable populations and eco-systems.
- Alignment of development projects with Nepal's national development priorities and the Sustainable Development Goals (SDGs).
- Existing policy frameworks, regulatory mechanisms, and institutional arrangements governing infrastructure development in Nepal.
- Policy gaps and areas for reform to enhance transparency, accountability, and efficiency in infrastructure decision-making and project delivery.
- Best practices and lessons learned from infrastructure projects, climate change initiatives, digitalization in other developing countries highlighting effective governance structures, stakeholder engagement strategies, and risk management approaches.

Keynote Address

Professor Dr. Govind Raj Pokharel

Former Vice Chairman

National Planning Commission of Nepal

Nepal's Neighbours are rising economically and their influence in world affairs is growing globally. Nepal is landlocked between these two economically and strategically giant nations. With northern Neighbour, Nepal had trade and political relationship even before the Betrawati Treaty between Nepal and Tibet in 1792. The bond with southern neighbour is very close culturally, socially and economically for centuries. India is 45 times more populous than Nepal; 90 times larger in economy and per capita income is twice of Nepal. Economically, India has compounded annual growth rate of 8.5% for last 10 years whereas China has 8.6% and Nepal has only 5.5%. Nepal is geopolitically in very strategic position and has been working closely with its both neighbours.

However, due to political instability, climate change and its own geographic location, Nepal could not do well in economic development as compared to its neighbours. Nepal needs to have geopolitical understanding to utilize the opportunities and achieve prosperity and development. Economically, Nepal's own revenue is continuously shrinking for last few years. Nepal collects its' more than 45% revenue from the customs- that is mainly because of import of consumable products from and via India.

Despite being an agriculture country, agriculture products account almost one fourth of total import. So, Nepal's own earning through customs duties, taxes etc is very vulnerable and sensitive because of heavily relying on import of consumable goods. The consumption is fuelled by remittance that is also vulnerable due to global and regional geopolitics. For coming fiscal year, the government even has reduced the revenue target by more than 11%, realizing that the revenue collection is becoming harder and harder. This will have political consequence because government may not be able to manage

resource even for recurrent expenditure and forced to take loan that will continuously increase public debt even for unproductive purposes.

Foreign direct investment (FDI) inflow to Nepal as compared to the other countries in South Asia is low. Major sources for FDI are India and China. However, figures are not encouraging. Apart from creating investment environment within the country, Nepal needs to have very strong and smart economic diplomacy for sustained FDI. FDI can be utilised to promote industries and infrastructure within the country for overall economic development. FDI can also be used to utilize Nepal's natural and human resource for the export of goods and services. Being a land locked developing country, Nepal needs to coordinate and cooperate with neighbouring countries to have access to the bigger and global market. FDI could be helpful to Nepal as Nepal has few options to raise its financial resources for overall development and to pay debt. Nepal earns limited foreign currencies and major potential areas for earning foreign currencies are remittances, export of energy, IT products, tourism and high value products. We are globally connected but no material influence (except export of labour) to export and create markets for our products beyond border. This indicated Nepal is weak in economic diplomacy for taking advantage of geopolitics and global connections.

As a poor country, Nepal with public debt nearly 45% of GDP is already in vicious circle of debt because it needs loan to pay debt. The prolonged addiction to remittance has become another source of fiscal risks in Nepal. It has fuelled a consumption-led economy hurting local production. Remittance has also negative side effects on the political economy. The government and major political parties may be less responsive to the needs of people as they do not have strong pressure to work hard for internal economic development because many active youths are living outside the country. Since last almost one and half decades, the structure of the budget is also a source of fiscal concern. The ratio of recurrent expenditure and capital expenditure, continuously increasing.

Increasing public debt will have two effects on our political economy. First, this could push the country into the vicious cycle of borrowing more to pay off the existing external debt. This is a symptom of a steady state where a country spends a substantial amount of public budget for regular liability leaving limited resources for social development, employment creation, economic growth. As Plato said: "The basic function of democratic government is to maintain the condition and provide education that enables

its citizens to live good and virtuous lives. This will further increase the economic vulnerability and disparity in our society. Even if we develop, taking loans initially, inequality will increase as per Kuznets curve theory. That will lead to political instability.

As Paul Collier has mentioned in his book “The Bottom Billion”, economic development is the prerequisite of achieving a major reduction in the global incidence of conflict/civil war. He stated that because low income means poverty, and low growth means hopelessness. Young men, who are the recruits for rebel armies/rebellion, come pretty cheap in an environment of hopeless poverty. He further emphasizes, life itself is cheap in such a hopeless environment, and joining a rebel movement gives these young men a small chance of riches. His research came up with the conclusion that it is not surprising that the typical post-conflict country has little better than a fifty-fifty chance of making it through the first decade in peace. Indeed, about half of all civil wars are post-conflict relapses. During the conflict, skills, organizations and investments build up that are only of use through violence and illegal means. Peace is costly for these interests and so they will look for opportunities to revert to conflict. If political chaos and conflict increases, because of Nepal’s sensitive geo-location, it will create interest beyond the border. That is why Nepal’s development process is very important in the current geopolitical context.

Secondly, if debt continuously rises, Nepal needs to accept and borrow funds from other countries and institutions even in harder conditions/ or terms to run its own affairs. This will again create some political vibration in Nepal. As we know when Nepal was accepting a simple grant MCC, we had a very interesting political debate within our country and beyond. This will further lead us into a geopolitical game. Looking at the weak capacity of our system, an appalling picture can be imagined when Nepal is forced to get desperately financial support to manage its financial affairs. Nepal needs a capable diplomacy in such a case but we lack such a capable system currently.

Nepal is an economically poor country in South Asia. South Asia, with more than two billion people i.e. more than 25% of global population, is experiencing different political economies since COVID 19, Russia-Ukraine war and other global and regional conflicts. Regionally, two emerging powers India and China are competing each other in different aspects. Because of large markets, growing consumption, many important shipping routes and abundant resources, the region is geopolitically very sensitive. In addition

to that Nepal, a land locked country between two globally emerging powers who are now actively engaging in global politics apart from their economic power and market influence.

However, if our historical relationships are managed well through capable and enlightened political leadership and we are smart enough, Nepal can take advantages of being a nation within two emerging economic powers. Nepal has historical relationship with India and China since the seventh century. There are many treaties and agreements. We know that having a strong socio-cultural bond at the people's level, open borders, the major source of humanitarian aid and development finance, and a large market at your door step is a fortune. Neighbourhood spill overs can be a huge blessing for Nepal as it is landlocked. Based on Paul Collier's book, if neighbours grow by 1%, neighbouring countries will grow by 0.4%; but landlocked countries it is 0.7%.

We have comparative advantage with both neighbours and Nepal should also be sensitive with neighbours' priority. For India, great power aspirations for spheres, security concerns and vulnerabilities associated with a rising economy are major areas of interest whereas for Nepal, faster economic development managing the hurdles posed by land-lockedness in a respectful manner realizing its sensibilities are some aspects of priority. By realizing Nepal's sensitiveness and state of economic development, Prime Minister Narendra Modi proposed HIT - highways, info ways and trans ways (HIT) for Nepal and India economic cooperation in his address to Nepal's parliament in 2014. Nepal has already been connected with Indian electricity market. Nepal needs to connect with Indian growth poles through expressways and info ways to get mutual benefits of growing markets in the region.

It is well-known fact that prosperity in 21st century depends on movements of people, goods, money, energy and knowledge. Looking at FDI and technology transfer, Nepal is not doing enough. Nepal has costly access to the global markets beyond India. However, about 700 million people of India live in the states that border or are closest to Nepal. Nepal is already supplying clean energy, a trainable low-wage workforce to meet Indian's growing demand for energy and human resources. Nepal can extensively explore the niche high value-to-weight ratio products for India's growing market. In addition to that Nepal's cool hills, heritage and popular religious places are suitable for tourism and landscape marketing. We can mobilize huge private investment from India then connecting global value chain for its products.

Nepal requires huge investment for productive sectors like infrastructure and industries for which Nepal can also borrow soft loan through EXIM bank apart from FDI and grant from India. Nepal can also adopt India's application of mass socio-economic innovation and policies that are successful to boost economic growth and help millions of people from bottom of the pyramid in India.

With northern neighbour China, Nepal can have priorities like air connectivity for people, high value low volume exports. Nepal can also utilize financing may be through BRI on par with MDBs. Nepal can also have cooperation on skills development, entrepreneurship and low-cost augmentation of productivity via technology transfer and private investment in industrial sector.

Nepal must also prepare project banks considering long-term impacts nationally and globally so that any sort of financial lending will be absorbed sustainably without bringing controversies because of geopolitical dimensions. Nepal should build its capacity to negotiate, analyse, and communicate well with common people regarding economic collaboration and cooperation with our neighbours. Nepal should also take into account geo-political aspects and concerns of neighbours while taking any decisions on bilateral cooperation. Nepali politicians should manage Nepal's political problems themselves and capacitate foreign service for win-win economic and bilateral cooperation.

The Great Game Reloaded: China and the US in a New Era of Global Influence

Major General (Retd.) Binoj Basnyat

In the contemporary geopolitical arena, the competition between China and the United States of America for global influence stands as one of the defining features of the 21st century. This rivalry, characterised by economic prowess, technological innovation, diplomatic maneuvering, and military posturing, encapsulates the shifting power dynamics that shape our world. As the two largest economies with starkly different political systems and ideological foundations, China and the US vie for dominance across multiple fronts, reshaping international relations and challenging the existing global order.

At the heart of this competition lies geopolitics, economic supremacy and development. China's meteoric rise as an economic powerhouse over the past few decades has been nothing short of remarkable. Its adoption of market-oriented reforms, massive investments in infrastructure, and a relentless drive for technological advancement have propelled it to the forefront of the global economy. The Belt and Road Initiative (BRI), China's ambitious infrastructure and investment program spanning multiple continents, exemplifies its strategic vision to expand its economic influence globally. Through BRI, China seeks to build infrastructure, deepen economic ties, and enhance connectivity, thereby extending its sphere of influence and solidifying its position as a key player in international trade and investment.

In response to China's growing economic clout, the US has pursued a policy of economy as a tool of power exertion, leveraging its own economic might and alliances to counterbalance China's influence. The continuation of trade war that began from Trump administration with China underscored this approach, with tariffs and trade restrictions aimed at curbing China's economic expansion and addressing concerns over intellectual property theft and unfair trade practices.² While the Biden administration has adopted a more multilateral approach³, emphasizing cooperation with allies to confront China's economic confidence, the underlying goal remains the same: to maintain American economic dominance and preserve the existing international economic order, which has long been shaped by US-led

1 https://en.wikipedia.org/wiki/Belt_and_Road_Initiative

2 <https://apnews.com/article/biden-china-tariffs-electric-vehicles-evs-solar-2024ba735c47e04a50898a88425c5e2c>

3 <https://www.hindustantimes.com/ht-insight/international-affairs/us-trade-sanctions-on-china-can-affect-multilateralism-101717823205428.html>

institutions like the World Bank (WB) and the International Monetary Fund (IMF)⁴.

However, the competition between China and the US extends far beyond economics.⁵ It encompasses technological innovation, where both countries are engaged in a race for supremacy in emerging technologies such as artificial intelligence (AI), quantum computing, and 5G telecommunications. China's 'Made in China' 2025 initiative outlines its strategic ambition to become a global leader in cutting-edge technologies, posing a direct challenge to America's technological dominance. The US, on the other hand, has taken measures to restrict China's access to critical technologies, citing national security concerns and the need to safeguard sensitive information from Chinese espionage and cyber threats.

Diplomatically, China has been steadily expanding its influence through a combination of bilateral partnerships, multilateral forums, and strategic investments. The Asian Infrastructure Investment Bank (AIIB), which China launched in 2016, represents a direct contest to the US-dominated WB and reflects China's efforts to reshape global governance structures in line with its own interests. Similarly, China's growing presence in international organizations such as the United Nations and its active role in mediating regional conflicts have enhanced its diplomatic clout and positioned it as a key player in shaping global affairs.

Meanwhile, the US has sought to rally its traditional allies and partners to contain China's influence and uphold liberal democratic values. Initiatives such as the Quad, a strategic alliance comprising the US, Japan, Australia, and India, aim to counterbalance China's firmness in the Indo-Pacific Region (IPR) and promote a rules-based order rooted in democratic principles and respect for human rights. Trilateral security partnership amongst Australia, UK and US AUKUS intends to promote deeper information sharing and technology sharing; and foster deeper integration of security and defence-related science, technology, industrial bases and supply chains.⁶ The US is wooing Asian tech economies amongst Japan, South Korea Taiwan and to join a mega semiconductor supply chain, which excludes China known as Chip four alliance.⁷ In August 2023, the leaders of Japan, the South Korea, and the US met for an unprecedented in-person summit at Camp David to expand and deepen trilateral relations "The Spirit of

4 <https://www.bloomberg.com/news/articles/2024-06-12/china-tariffs-why-biden-is-doubling-down-on-trump-s-levies>

5 <https://www.voanews.com/a/beijing-vows-retaliation-against-biden-s-hikes-of-tariffs-on-chinese-imports/7613819.html>

6 <https://carnegieendowment.org/posts/2023/03/the-aukus-submarine-deal-highlights-a-tectonic-shift-in-the-us-australia-alliance?lang=en¢er=global>

7 <https://fortune.com/asia/2024/03/28/chip-4-alliance-us-korea-japan-taiwan-semiconductors-china-opeccartel-for-digital-age/>

Camp David”.⁸ Additionally, the US has intensified its efforts to counter China’s BRI by offering alternative financing mechanisms and infrastructure development programs aimed at enhancing transparency, accountability, and sustainability. Build Back Better World (B3W) which the Group of Seven (G7) initiated in June 2021 to promote economic development and inter-regional connectivity⁹, later after a year recalibrated as Partnership for Global Infrastructure Investment (PGII)¹⁰ to fund infrastructure projects in developing nations is an exemplar.

Militarily, both China and the US have been expanding their capabilities and asserting their presence in strategic regions. China’s military modernization program, coupled with its insistent territorial claims in the South China Sea (SCS) and its growing naval capabilities in addition in the Himalayas along China and India border has raised concerns among its neighbors¹¹ and prompted the US to bolster its military presence in the IPR. The US, for its part, has reaffirmed its commitment to upholding freedom of navigation and ensuring security and stability in the Indo-Pacific, conducting joint military exercises with regional partners and deploying advanced weaponry to deter potential adversaries.

The competition between China and the US for global influence is not merely a zero-sum game but rather a complex interplay of strategic maneuvering, economic interdependence, and ideological rivalry. While both countries seek to advance their own interests and project power on the world stage, they also recognize the need for cooperation on global challenges such as climate change, pandemics, and nuclear proliferation. The recent cooperation between China and the US on climate change, culminating in the joint declaration at the COP26 summit, underscores the potential for collaboration even amidst geopolitical tensions.¹²

Eventually, the outcome of the competition between China and the US will shape the course of global affairs in the 21st century. Whether it leads to a new Cold War or Cold War 2.0 marked by confrontation and conflict or a more nuanced and cooperative relationship defined by mutual respect and shared interests remains to be seen. What is certain, however, is that the rivalry between these two giants will continue to shape the geopolitical landscape for years to come, with far-reaching implications for the international community and the future of global governance.

8 <https://www.cnas.org/publications/reports/forging-a-new-era-of-u-s-japan-south-korea-trilateral-cooperation>

9 <https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/12/fact-sheet-president-biden-and-g7-leaders-launch-build-back-better-world-b3w-partnership/>

10 <https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/20/fact-sheet-partnership-for-global-infrastructure-and-investment-at-the-g7-summit/>

11 <https://www.nbcnews.com/news/world/china-new-map-anger-india-south-china-sea-border-disputes-rcna102921>

12 <https://www.bbc.com/news/science-environment-59238869>

Geopolitical landscapes

The relationship or the rivalry of China and the US will posture and shape geopolitics impacting every region and every country¹³. For South Asia the relationship between China and India will play significant to all South Asian Nations on their strides to prosperity and stability¹⁴.

International organisations engagements are getting ineffective and weaker. At the global stage is the recent proceedings at the UN from the War in Ukraine to the War in Gaza. The purpose and principles of the UN charter “To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of the peace” has been questioned by the Permanent five.

With the end of the Cold War US unipolar state is being challenged by China and Allies. Arguable but no denial that the analogy of the WW-II; the Axis and Allied are being formed and the Middle power and regional power’s engagement will play a significant role in creating a favourable geostrategic and geoeconomics environment in addition the Middle powers and regional powers have noteworthy potent in influencing to shape the policies of both China and the US or the multipolar world.

Two largest economies, two different political contemplation / thoughts, two most powerful militaries are competing in the multipolar world. Multipolar is specifically not unipolar and not bipolar. US stood as the unipolar power with the end of Cold War after the collapse of the Soviet Union in 1990 and bipolarity is in the forming.

The geopolitics and geostrategic is more focused in the centrality of the world and that is the Indo-Pacific Region. Prof Graham Allison said in World Economic Forum Davos Jan 2024 said that “complexity in reality—remember three numbers 50 or half 25 or quarter, seven and picture this in the last 75 years. Half is what the US global GDP share after WW-II, quarter is the GDP after the end of the Cold war and seven is today in Purchase Power Parity.”

13 <https://www.brookings.edu/articles/is-the-us-china-relationship-the-most-consequential-relationship-for-america-in-the-world/>

14 <https://carnegieendowment.org/research/2021/10/chinas-influence-in-south-asia-vulnerabilities-and-resilience-in-four-countries?lang=en¢er=global>

South Asia prosperity and stability: Navigating the geopolitical chessboard

In the dynamic landscape of South Asia, the relationship between China and India emerges as a pivotal factor shaping the region's trajectory towards prosperity and stability. As two of the largest and fastest-growing economies in the world, China and India wield considerable influence not only within their own borders but also across the broader South Asian region. The dynamics of their relationship, characterized by a mix of cooperation, competition, and occasional confrontation, have far-reaching implications for the economic development, political stability, and security architecture of South Asia as a whole.

Economic Interdependence: At the heart of the China-India relationship lies economic interdependence. China has emerged as India's largest trading partner, with bilateral trade volumes reaching billions of dollars annually. Chinese investments in infrastructure projects, manufacturing, and technology sectors in India have contributed to job creation and economic growth, while Indian businesses have also sought opportunities to tap into the vast Chinese market. However, the economic relationship between the two countries is not without challenges. Trade imbalances, market access issues, and concerns over intellectual property rights have strained bilateral ties at times, leading to trade disputes and regulatory hurdles.

Regional Infrastructure and Connectivity: China's ambitious BRI, aimed at enhancing connectivity and promoting economic integration across Eurasia, has significant implications for South Asia. Infrastructure projects such as the China-Pakistan Economic Corridor (CPEC) and the Bangladesh-China-India-Myanmar (BCIM) Economic Corridor have the potential to transform regional trade dynamics and spur economic development. However, India has expressed reservations about certain aspects of the BRI, citing sovereignty concerns and the strategic implications of China's growing presence in its neighborhood. The contestation over infrastructure and connectivity projects underscores the broader geopolitical competition between China and India for influence in South Asia.

Security Dynamics: Security considerations also loom large in the China-India relationship, particularly in the context of territorial disputes and strategic rivalries. The unresolved border dispute between the two countries, exemplified by the recent tensions in the Himalayan region of Ladakh, underscores the underlying mistrust and competition for territorial control. China's close ties with Pakistan, India's arch-rival, further complicate the security calculus, with implications for regional stability and the balance of power in South Asia. Additionally, China's expanding naval presence in the

Indian Ocean and its strategic partnerships with countries like Sri Lanka and the Maldives raise concerns about its intentions and influence in the maritime domain.

Diplomatic Maneuvering: Diplomatically, China and India engage in a delicate balancing act, seeking to advance their respective interests while avoiding direct confrontation. Both countries are active participants in regional forums as an observer in the South Asian Association for Regional Cooperation (SAARC) and a member in the Shanghai Cooperation Organization (SCO), where they vie for influence and seek to shape the agenda according to their own priorities. Despite occasional differences and disagreements, China and India have also cooperated on global issues such as climate change, multilateral trade negotiations, and peacekeeping operations, recognizing the importance of constructive engagement on common global argues.

Implications for South Asian Nations: The evolving relationship between China and India has significant implications for the broader South Asian region. Smaller countries in South Asia, including Nepal, Bhutan, Sri Lanka, and the Maldives, navigate a delicate balancing act between their ties with China and India, seeking to leverage the economic opportunities presented by both while avoiding being drawn into geopolitical rivalries. Chinese investments in infrastructure projects, such as ports, roads, and energy facilities, offer much-needed capital and technology transfer to these countries but also raise concerns about debt sustainability, environmental impact, and strategic dependencies.

Prospects for Cooperation and Competition: Looking ahead, the future of China-India relations will be shaped by a complex interplay of cooperation and competition across multiple domains. Economic cooperation, driven by trade, investment, and connectivity initiatives, has the potential to foster mutual prosperity and regional integration. At the same time, strategic competition, fueled by geopolitical rivalries, territorial disputes, and security concerns, poses challenges to stability and poses risks of escalation. The key challenge for China and India lies in managing their differences, building trust, and finding common ground on issues of mutual interest while respecting each other's sovereignty and territorial integrity.

The relationship between China and India will continue to be a central determinant of South Asia's prosperity and stability in the years to come. As the two largest economies and most populous countries in the region, China and India have a shared interest in fostering economic growth, promoting regional cooperation, and maintaining peace and security. However, the complexities of their relationship, marked by a mix of cooperation and competition, require careful navigation and proactive diplomacy to mitigate

risks and seize opportunities for mutual benefit. By engaging constructively and addressing their differences through dialogue and cooperation, China and India can contribute to a more stable, prosperous, and interconnected South Asia, benefitting not only themselves but also the broader region as a whole. The long and great game is of the rivals and the middle powers crisscrossing on global governance and regional geopolitics is on the intensification requires further discussion.

Global governance

Global governance refers to the framework of institutions, norms, rules, and processes that facilitate cooperation and address common challenges at the international level. In an increasingly interconnected and interdependent world, global governance plays a crucial role in managing transnational issues such as climate change, economic inequality, pandemics, terrorism, and nuclear proliferation. It encompasses a wide range of actors, including states, international organizations, non-governmental organizations (NGOs), multinational corporations, and civil society groups, all of which contribute to shaping the rules and norms that govern international relations.

At the core of global governance are international institutions such as the UN, the WB, the IMF, and the World Trade Organization (WTO). These institutions serve as forums for dialogue, negotiation, and decision-making among member states, providing mechanisms for conflict resolution, humanitarian assistance, development aid, and economic cooperation. The UN, in particular, plays a central role in setting global agendas, promoting peace and security, protecting human rights, and coordinating responses to global crises through its specialized agencies and affiliated bodies.

In addition to formal institutions, global governance also encompasses informal mechanisms of cooperation, such as multilateral treaties, conventions, and agreements. These legal frameworks provide a basis for addressing specific issues ranging from environmental protection to arms control to trade liberalization. Examples include the Paris Agreement on climate change, the Kyoto Protocol on greenhouse gas emissions, and the Nuclear Non-Proliferation Treaty (NPT), which seek to mitigate global challenges through collective action and shared responsibilities.

Civil society actors and non-state actors also play an increasingly important role in global governance, amplifying voices, advocating for change, and holding governments and international organizations accountable. Non-Governmental Organisations (NGO), grassroots movements, advocacy groups, and social media networks contribute to shaping public opinion, mobilizing resources, and influencing policy outcomes on issues ranging from human rights to corporate accountability to public health. Through their advocacy efforts, these actors help bridge the gap between global

decision-makers and local communities, ensuring that diverse perspectives and interests are taken into account in the formulation and implementation of policies.

Despite the importance of global governance, the current system faces numerous challenges and shortcomings. One of the key challenges is the lack of effective enforcement mechanisms and compliance mechanisms, which limit the ability of international institutions to implement decisions and hold states accountable for their actions. The absence of a global authority with the power to enforce rules and resolve disputes undermines the legitimacy and effectiveness of global governance, leading to issues of sovereignty, power asymmetries, and inequality.

Moreover, the rise of populist nationalism, protectionism, and geopolitical rivalries poses a threat to multilateralism and international cooperation, as countries prioritize narrow self-interests over collective goals. The US' withdrawal from international agreements and institutions under the Trump administration, including the Paris Agreement and the Iran nuclear deal, exemplifies the erosion of global norms and institutions in the face of unilateralism and isolationism.

In response to these challenges, there is a growing recognition of the need for reform and revitalization of global governance to address contemporary global challenges effectively. This includes strengthening the role of international institutions, enhancing cooperation between states and non-state actors, promoting inclusive and participatory decision-making processes, and addressing structural inequalities in global governance structures. By working together to build a more equitable, resilient, and sustainable global order, the international community can ensure that global governance remains effective in addressing the complex challenges of the 21st century.

Unfolding conflicts

The contemporary geopolitical landscape is marked by a series of conflicts that have far-reaching implications for regional stability and global security. Among these, the war in Ukraine, the conflict in Gaza, and the looming specter of a potential war in Taiwan stand out as critical flashpoints that have the potential to reshape the dynamics of international relations. Each conflict is unique in its origins, dynamics, and consequences, yet they share common themes of territorial disputes, geopolitical rivalries, and the complex interplay of domestic and international factors.

Analyzing two wars, the War in Ukraine and the War in Gaza, and the prospects of hostilities in South China Sea and the Taiwan Strait.

- The War in Ukraine: The war in Ukraine, which erupted in 2014 following Russia's annexation of Crimea and its support for separatist rebels

in eastern Ukraine, represents a major challenge to European security and stability. The conflict has its roots in Ukraine's complex historical, ethnic, and geopolitical dynamics, with competing narratives and grievances fueling tensions between Ukrainian nationalists, Russian-speaking minorities, and external actors. Russia's intervention in Ukraine, ostensibly to protect ethnic Russians and assert its influence in its "near abroad," has triggered a protracted conflict characterized by violence, displacement, and diplomatic stalemate.

The conflict in eastern Ukraine, centered around the Donetsk and Luhansk regions, has claimed thousands of lives and displaced millions of civilians, exacerbating humanitarian crises and deepening divisions within Ukrainian society. Despite efforts to broker ceasefires and negotiate peace agreements, the conflict remains unresolved, with sporadic outbreaks of violence and continued Russian military presence in the region. The war in Ukraine has strained relations between Russia and the West, leading to sanctions, diplomatic isolation, and heightened military tensions in Europe.

- Persian Gulf/ Middle East – Though China's initiative for bringing in Saudi Arabia and Iran back to the diplomatic table; Hamas attack in Israel has invited Gaza war so far preventing wider conflict. The conflict in Gaza, which has flared up periodically over the past few decades, revolves around the Israeli-Palestinian dispute and the broader Israeli-Arab conflict. Rooted in historical grievances, territorial disputes, and competing claims to land and resources, the conflict in Gaza has been characterized by cycles of violence, reprisals, and failed peace initiatives. The main actors in the conflict are the State of Israel and various Palestinian factions, including Hamas, which controls the Gaza Strip.

The conflict in Gaza is characterized by asymmetric warfare, with Israel's military superiority and technological capabilities pitted against Hamas's guerrilla tactics and asymmetric warfare. The cycle of violence often escalates in response to provocations, rocket attacks, and acts of terrorism, leading to devastating consequences for civilians on both sides. The blockade of Gaza, imposed by Israel and Egypt, exacerbates humanitarian suffering and limits access to basic necessities such as food, water, and healthcare.

Efforts to resolve the conflict in Gaza through diplomatic means, including peace negotiations, ceasefire agreements, and international mediation, have met with limited success. The underlying issues of statehood, sovereignty, and security remain unresolved, perpetuating a cycle of vi-

olence and instability in the region. The conflict in Gaza is not only a humanitarian crisis but also a geopolitical flashpoint that reflects broader tensions and rivalries in the Middle East.

In the Indo-Pacific Region, the situation in South China Sea and the Taiwan strait is an indication of China's firmness in the region and its posture on "One China" policy. Just days after Taiwan inaugurated its new president, Lai Ching-te, who is a staunch advocate for Taiwan's sovereignty. China launching two days of military drills encircling Taiwan and described as "punishment" for "separatist acts. China's military says the drills are designed to test its ability to "seize power" over Taiwan.

- The prospect of a potential war in Taiwan looms large as tensions between China and Taiwan escalate over issues of sovereignty, independence, and territorial integrity. Taiwan, officially known as the Republic of China, is a self-governing island democracy that Beijing regards as a renegade province and seeks to reunify with the mainland, by force if necessary. The Taiwan Strait, which separates Taiwan from mainland China, has emerged as a potential flashpoint in the broader contest between China and the United States for regional influence and strategic dominance.

The roots of the Taiwan issue date back to the Chinese Civil War and the retreat of the Nationalist government to Taiwan in 1949 following its defeat by the Communist forces. Since then, Taiwan has developed into a vibrant democracy with a thriving economy and a distinct identity separate from mainland China. However, Beijing's insistence on the "One China" principle and its refusal to recognize Taiwan's sovereignty pose a constant source of tension and uncertainty in cross-strait relations.¹⁵

In recent years, China has adopted a more assertive posture towards Taiwan, stepping up military drills, conducting naval patrols, and issuing veiled threats of force to deter moves towards independence. The US, in turn, has reaffirmed its commitment to Taiwan's security and stability, supplying arms, conducting military exercises, and enhancing diplomatic ties with Taipei. The potential for a military conflict in Taiwan stems from the complex interplay of domestic politics, nationalist sentiments, and strategic calculations on both sides of the Taiwan Strait.

- Non-state actors

The Yemen's Houthis¹⁶ have a complex relationship with Yemen's Sunnis;

15 http://ph.china-embassy.gov.cn/eng/sgdt/202403/t20240319_11262567.htm#:~:text=The%20one%2DChina%20principle%20is%20a%20basic%20norm%20in%20international,183%20countries%20including%20the%20Philippines.

16 Red Sea Shipping Crisis: What's at Stake? | Geopolitical Monitor

the movement has discriminated against Sunnis but has also allied with and recruited them. The Houthis aim to govern all of Yemen and support external movements against the United States, Israel, and Saudi Arabia.

The Houthis supported by Iran have been attacking ships in the Red Sea and firing missiles and drones at Israeli targets in a show of support for Palestinians in Gaza, drawing anger from the western administrations.

The Red Sea crisis continues to ripple throughout global supply chains. The Suez Canal, a shipping choke point that typically accounts for around 30% of global container traffic, has seen traffic drop by a remarkable 80% since the Gaza War broke out in November of 2023. Asian shippers are instead opting for the safety of rounding the Cape of Good Hope en-route to Europe, extending freight times by up to 30%. Longer journeys are being reflected in higher container freight costs, which are now climbing toward pandemic-era highs. These costs will ultimately be borne by consumers, though there's disagreement over to what extent, with estimates ranging from 0.3% to 2% in increased goods inflation. The takeaway here is that increased shipping costs will generate upward price pressure for the immediate future. According to Nora Szentivanyi of JP Morgan: "... even a modest rebound in goods inflation could render global core CPI inflation sticky around the 3% mark." This is a significant number given the stated inflation target of 2% across much of the Western world, in addition to growing political awareness and sensitivity surrounding cost-of-living issues¹⁷.

The wars in Ukraine and Gaza, along with the looming specter of a potential conflict in Taiwan in addition the use of militias underscore the volatile nature of contemporary geopolitics and the persistent challenges to peace and stability in key regions around the world. These conflicts are fueled by a complex array of factors, including historical grievances, territorial disputes, geopolitical rivalries, and the interplay of domestic and international dynamics. Resolving these conflicts requires sustained diplomatic engagement, dialogue, and compromise among all parties involved, as well as a commitment to upholding international law, human rights, and the principles of peaceful coexistence. Only through concerted efforts to address the root causes of conflict and promote inclusive and equitable solutions can the international community hope to achieve lasting peace and security in these troubled regions.

Competing visions of global governance

In the evolving landscape of global governance, the China and US rivalry stands out as a defining feature that shapes the trajectory of international

¹⁷ <https://www.geopoliticalmonitor.com/red-sea-shipping-crisis-fueling-sticky-inflation/>

relations. As the world's two largest economies and most influential powers, China and the US each espouse distinct visions of global governance, reflecting their contrasting political systems, strategic interests, and ideological outlooks. The competing concepts of global governance advanced by the two competitors need examining their respective approaches, priorities, and implications for the international order.

The US: Champion of liberal internationalism

Since the end of World War II, the US has played a central role in shaping the architecture of global governance based on the principles of liberal internationalism. Rooted in democratic values, free-market economics, and a rules-based order, the US-led liberal international order has sought to promote peace, prosperity, and cooperation among nations through multilateral institutions, alliances, and norms. Key pillars of this order include the United Nations, the WB, the IMF and the World Trade Organization (WTO), which serve as forums for collective action, conflict resolution, and economic cooperation.

The US vision of global governance emphasizes the primacy of democratic governance, human rights, and the rule of law as universal values that transcend national boundaries. Through its foreign policy and diplomatic initiatives, the US seeks to advance these values by promoting democracy, supporting civil society, and fostering accountable governance around the world. Additionally, the US advocates for open markets, free trade, and economic liberalization as drivers of global growth and development, epitomized by initiatives such as the North American Free Trade Agreement (NAFTA) and the Trans-Pacific Partnership (TPP).

Furthermore, the United States has historically championed collective security arrangements, such as North Atlantic Treaty organization (NATO) and the United Nations Security Council (UNSC), to address global security challenges and deter aggression. Through its military alliances and security partnerships, the US seeks to uphold peace and stability in regions of strategic importance, deter common threats, and project power globally. However, critics argue that US-led interventions in Afghanistan, Iraq and other conflicts have undermined the legitimacy of liberal internationalism and fueled anti-American sentiment.

China: Advocate of multipolarity and non-interference

In contrast to the US-led liberal international order, China advocates for a concept of global governance rooted in principles of multipolarity, sovereignty, and non-interference in domestic affairs. Building on its historical legacy as

a civilization state and its experience of colonialism and foreign intervention, China emphasizes the importance of national sovereignty, territorial integrity, and non-intervention as fundamental principles of international relations. This approach reflects China's commitment to upholding state sovereignty as the cornerstone of global governance and resisting external interference in its domestic affairs.

China's vision of global governance is also informed by its emphasis on mutual respect, equality, and win-win cooperation among nations. Through initiatives such as BRI and AIIB, China seeks to promote infrastructure development, connectivity, and economic integration across regions, emphasizing South-South cooperation and development partnerships. Additionally, China advocates for reforming existing global governance institutions to better reflect the interests and perspectives of developing countries, arguing for greater representation and decision-making power for emerging economies.

Furthermore, China rejects the use of force or coercion in international relations and advocates for peaceful resolution of conflicts through dialogue, negotiation, and diplomacy. While China maintains a policy of non-alignment and strategic autonomy, it has increasingly sought to expand its influence and shape the global agenda through active participation in multilateral forums such as the United Nations, the Group of 20 (G20), and the Brazil-Russia-India-China-South Africa (BRICS) group. However, China's growing assertiveness in territorial disputes in the South China Sea, its repression of domestic dissent, and its use of economic coercion have raised concerns about its commitment to international norms and values.

Implications for global governance

The competing visions of global governance advanced by China and the US reflect broader geopolitical rivalries and ideological divides that shape the international order. While the US-led liberal international order seeks to uphold democratic values, human rights, and open markets, China's vision emphasizes sovereignty, non-interference, and mutual respect among nations. The clash between these competing visions has implications for key issues such as trade, climate change, security, and development, as well as for the future of multilateralism and international cooperation.

- **Trade and Economic Relations:** The China-US rivalry has profound implications for global trade and economic relations, as both countries vie for influence and seek to shape the rules of the global economy. The US has criticized China's trade practices, including intellectual property theft, forced technology transfer, and state subsidies to domestic industries, leading to tensions and trade disputes between the two countries.

The China-US trade war, initiated by the Trump administration, highlighted the challenges of reconciling divergent economic interests and values within the global trading system.

- **Climate Change and Environmental Cooperation:** Climate change represents another area of competition and cooperation between the US and China, as both countries are the world's largest emitters of greenhouse gases. While the US has historically played a leading role in global efforts to address climate change, the Trump administration's withdrawal from the Paris Agreement and its skepticism towards international climate cooperation created a leadership vacuum that China sought to fill. China has pledged to achieve carbon neutrality by 2060 and has positioned itself as a champion of renewable energy and sustainable development on the global stage.
- **Security and Geopolitical Rivalries:** The China-US rivalry extends beyond trade and economic issues to encompass security and geopolitical rivalries in key regions such as the Indo-Pacific. Tensions between the two countries over territorial disputes, military build-ups, and strategic competition have heightened the risk of conflict and raised concerns about the stability of the international order. The US has strengthened its military presence in the Indo-Pacific region and deepened security alliances with countries such as Japan, Australia, and India to counter China's growing assertiveness and assert its leadership in the region.
- **Multilateralism and International Institutions:** The China-US rivalry has implications for the future of multilateralism and international institutions, as both countries seek to shape the rules and norms that govern global governance. While the US has historically played a leading role in institutions such as the United Nations, the World Bank, and the World Trade Organization, China has sought to expand its influence and promote alternative models of governance through initiatives such as the Belt and Road Initiative and the Asian Infrastructure Investment Bank. The competition between the US and China for influence within existing institutions and the emergence of new institutional frameworks reflects broader power shifts and realignments in the international system.

Balancing competing visions for global governance

China and the US advance competing visions of global governance that reflect their respective values, interests, and strategic priorities. While the US-led liberal international order emphasizes democracy, human rights, and open markets, China's vision prioritizes sovereignty, non-interference, and mutual respect among nations. The clash between these competing visions has profound implications for the future of the international order, shaping

key issues such as trade, climate change, security, and development.

Balancing these competing visions for global governance requires dialogue, cooperation, and compromise among all stakeholders, including states, international organizations, civil society, and the private sector. While the US and China may have divergent interests and values, they also share common challenges and areas of mutual interest that require collective action and collaboration. By fostering inclusive and equitable solutions to global challenges, the international community can build a more resilient, sustainable,

Categories of development initiatives

There are two categories in global initiatives. One is un-nation which is led by China and the other in multi-nations led by the US. Partnership for cooperation for political influence comes in different forms bilateral, mini-lateral, multilateral and global initiatives.

China led development cooperation

Global Initiatives or global infrastructure development strategy that China has pursued is OBOR and referred also as the ‘New Silk Road. President Xi Jinping during his official visit to Kazakhstan in September 2013 announced to invest in more than 150 countries and international organisations which was adopted by the Chinese government in the same year. Also known as the BRI now is composed of six urban development land corridors linked by development of ports.¹⁸ The goals of the BRI were officially presented for the first time in a 2015 document, the Vision and Actions on Jointly Building Belt and Road BRI is one of the largest infrastructure and investment projects in history covering more than 68 countries, including 65 percent of the world’s population and 40 percent of the global GDP as of 2017. The BRI was launched amidst the United States’ “pivot to Asia” strategy, whereby Washington had just started to shift attention from the Middle East to the Asia-Pacific.

China’s legitimate security concerns regarding wars and potential wars in different parts of the globe is at the core while ambiguity has been one of the biggest obstacles to reform its ambition to shape the global order. Under Xi Jinping, China has become more explicit about its ambitions to reform the global order. Beijing has not systematically questioned the fundamentals of the order but rather increased its ability to effectively manoeuvre within the system by strengthening its role in the UN, at the same time, fostered regional mechanism with Africa, Central Asia, South Asia, Southeast Asia, Oceanic and Arab states. Intergovernmental organisation like BRICS and SCO have

¹⁸ https://en.wikipedia.org/wiki/Belt_and_Road_Initiative

been profoundly active to push its policy agenda where it is unable to do so within established international mechanisms.

The leadership has prioritised close relations with states from the “global South”, many of which share Beijing’s assessment about the need to reform the global order criticising the global role of the US and western double standards. The central elements of China’s vision are aimed as a community of common destiny (CCD) first used by President Hu Jintao to the 17th Party Congress in 2012.

“We need to make sure that all countries respect one another and treat each other as equals”.¹⁹ In January 2017, China issued a White Paper titled “China’s Policies on Asia-Pacific Security Cooperation”. The White Paper warned small and medium sized countries in clear terms noting: “small and medium-sized countries need not and should not take sides among big countries”.²⁰ It is evident that China wishes to build Sino-centric world order, favours hierarchal relations in international relations and such a policy has alienated many countries, including its neighbours. Further, China’s vision of a CCD could be highly problematic because it assumes that all countries want what China wants. It cannot be considered a pragmatic approach.²¹

- Global Community of Shared Future (GCSF)²² China’s State Council Information Office released a white paper titled “A Global Community of Shared Future: China’s Proposals and Actions.” On September 2023.²³
- Belt and Road Initiative²⁴ is a global infrastructure development strategy to invest in Asia, Europe and Africa to promote economic development and inter-regional connectivity.
- Global Development Initiative (GDI) concept was announced at the UN General Assembly in September 2021 by Xi Jinping to assist nations to achieve UN Sustainable Development Goals (SDG) 2030. Over 60 countries joined the group of friends of GDI. “Timely call-for-action to address the immediate challenge that threaten our collective ability to deliver on the SDG” was acclaimed by the World Economic Forum. The GDI was inaugurated against the backdrop of heightened great power competition and after the launch of a dedicated Indo-Pacific Strategy by the United States. Moreover, the United States and its allies began responding to the BRI with their own development arrangements – namely

19 Three takeaways from China’s key conference for 2022 economic plan - CGTN

20 Three takeaways from China’s key conference for 2022 economic plan - CGTN

21 One Year of China’s Global Development Initiative: High on Rhetoric, Low on Substance? - Indian Council of World Affairs (Government of India) (icwa.in)

22 http://english.scio.gov.cn/whitepapers/2023-09/26/content_116710660.htm

23 http://english.scio.gov.cn/whitepapers/2023-09/26/content_116710591.htm#:~:text=Building%20a%20global%20community%20of%20shared%20future%20is%20both%20a,right%20direction%20of%20building%20a

24 <https://eng.yidaiyilu.gov.cn/>

the B3W Initiative and the Global Gateway. Many regards them as rivals of the BRI, with the aim of asserting U.S. and European power in the realm of global infrastructure development.²⁵

- Global Security Initiative (GSI) was announced at Boao Forum for Asia in April 2022. The initiative highlighted the need for ‘common, comprehensive, cooperative and sustainable security’ and need to uphold the principle of ‘indivisible security’. GSI is also understood as a counter to Indo-Pacific and other proposals for Asian security in the emerging geopolitical situation. Additionally, the Chinese initiative also seemed to be aimed at creating alternative security architecture. The GDI echoes and reinforces the GSI.²⁶
- Global Civilization Initiative (GCI) was proposed on March in 2023 at the Communist Party of China (CPC) in Dialogue with World Political Parties High-Level Meeting. The initiative is added key community outcome provided to the world by China after the GDI, GSI. It is to uphold the principles of equality, mutual learning, dialogue and inclusiveness among civilizations, and let cultural exchanges to transcend estrangement, mutual learning to transcend clashes, and inclusiveness to transcend any sense of superiority.

It is an import part of the BRI through the GCSF with a continuity in strengthening China’s system – order and long-term stability which was adopted at the 18th national Congress, CPC of what China should look like in the future as a Second Centenary Goals.²⁷

Rather than laying out a concrete framework of what a desired global order would look like, China’s global initiatives primarily list general principles, which is an approach that opens the door to ambiguity for the West, while Beijing appears to remain the sole legitimate interpreter leaving the rest with confusion.

China’s deliberation and strategically pursuance is to becoming a global rule-setter. Beijing aims to:

- gain discourse power to reinterpret existing international norms and standards,
- generate technical expertise and
- sit at the table when it comes to clarifying the most avant-garde grey areas of international law.
- China’s priority areas to reshape the global order:

25 <https://thediplomat.com/2023/07/chinas-switch-from-the-belt-and-road-to-the-global-development-initiative/>

26 Three takeaways from China’s key conference for 2022 economic plan - CGTN

27 https://en.wikipedia.org/wiki/Two_Centenaries#:~:text=The%20centenary%20of%20the%20founding%20of%20the%20People%20Republic%20of,according%20to%20the%20People%20Daily.

- high seas
- polar regions
- cyberspace
- outer space
- nuclear sec.
- anti-corruption
- climate change
- AI
- digital economy
- internet finance
- big data
- cloud computing

China casts development cooperation as its duty as a responsible member of the global community, both as a provider and as a promoter of new trends and modalities. It anchors its approach in south-south cooperation (SSC), which has broader parameters than Official Development Assistance (ODA), and includes investments, diplomacy and other modalities, such as those implemented through the BRI.²⁸

UN Trade and Development (UNCTAD) Global Leaders Forum marking the 60th anniversary occurred in Geneva on 14 June with a strong presence, recognition and support from the leaders of countries reflecting the diversity of the Global South.

In a video address at the opening ceremony President Xi Jinping announced USD 20 million contribution to UNCTAD over the next five years to help implement the UN 2030 agenda for SDG so that no country is left behind. “China will always be a member of the Global South and the developing world”. He also stated that China is advancing Chinese modernization on all fronts through high-quality development, which will provide new and greater opportunities for world development.²⁹

G7 led global initiative

Signed in September 2023 amongst Arab Emirates, European Union, France, Germany, India, Italy, Jordan, Saudi Arabia and the US during the G20 New Delhi summit, the India-Middle East- Europe Economic Corridor (IMEC) is a \$20 billion global initiative to bolster economic development by fostering

²⁸ <https://devpolicy.org/chinas-gdi-soft-power-play-or-serious-commitment-20221018/>

²⁹ <https://unctad.org/press-material/un-secretary-general-and-global-leaders-mark-60-years-unctad-urging-equitable#:~:text=UNCTAD's%2060th%20anniversary%20celebration%20underscored,challenges%20and%20support%20developing%20countries.>

connectivity and economic integration between Asia, the Persian Gulf and Europe. The inclusion of the African Union has fundamentally altered the character of the platform, making it more inclusive and representative of the emerging global order³⁰

India is placed as a responsible global stake holder in North-South Cooperation with Global South at the center of the global governance agenda. The joint New Delhi declaration is a reminder to the world that it is beyond geopolitical conflicts that is also seeking a role in global decision-making. The challenges of sustainable development, inclusive growth, climate change, food security, digital divide, emerging tech regulation, and multilateral development bank reform cannot be undertaken without the developing world at the table.³¹

There will be two corridors with ship-to-rail with a plan to lay down a cable network for electricity and digital connectivity along the piper for clean hydrogen export; the east corridor will connect India with the Gulf countries and the northern corridor will connect Arabian Gulf with Europe.

G7 on June 2021 launched B3W USD 40 trillion worth infrastructure needed by developing countries by 2035 global initiative to build off the progress and principles of the Blue Dot Network. On June 2022, the initiative was re-launched and renamed as the PGII at the 48th G7 summit in Germany. Three documents including “Factsheet on the G7 Partnership for Global Infrastructure and Investment” were issued at the side event during the 49th G7 summit in Hiroshima though the details have not emerged.³²

50th G7 summit placed China under the microscope amid intensifying scrutiny of Beijing wartime support for Moscow and China’s competitive market behaviour. The three-day summit was held in Borgo Egnazia (Fasano) in Apulia on June 13-15.

“China is not supplying weapons, but the ability to produce those weapons and the technology available to do it. So it is, in fact, helping Russia,” was stated by President Joe Biden. G-7 nations will “continue to take actions to protect our businesses from unfair practices, to level the playing field and remedy ongoing harm”. Washington has repeatedly accused Beijing of dumping and has imposed sweeping tariffs on Chinese semiconductors, solar technology, electric vehicles, critical minerals, and medical supplies.

Development cooperation has various forms from bilateral, mini-later-

30 https://en.wikipedia.org/wiki/Partnership_for_Global_Infrastructure_and_Investment

31 <https://www.cfr.org/councilofcouncils/global-memos/was-g20-summit-turning-point-global-south>

32 https://en.wikipedia.org/wiki/Partnership_for_Global_Infrastructure_and_Investment

al, multilateral to global. The framing of the North-South cooperation and South-South cooperation is underway led by the US and China respectively. China is headed to lead the Group of G77 (G77) plus China with actively involved in Non-Alignment Movement (NAM). G7 nations or the democracies are more inclined with India through G20 for North-South Cooperation.

Analysing the 21st Shangri-La dialogue

Three personalities and three strategic messages are conveyed from the “track one” intergovernmental security conference. International Institute for Strategic Studies (IISS) Shangri-La dialogue, a premier defence conference where ministers debate the region’s most pressing security challenges, engage in important bilateral talks was held in Singapore from May 31 to 2nd June. Fresh approaches are sought together to mitigate strategic accidents.

Chinese Défense Minister Dong Jun delivered a speech on China’s approach to global security said:³³

- China values peace and harmony. Peaceful development is an integral part of our Constitution. We never seek hegemony or military expansion.
- Anyone who dares to split Taiwan from China is bound to be smashed to pieces and bring about their own ruin
- We won’t allow hegemonism, power politics to harm Asia-Pacific, won’t allow bringing in geo-conflicts, cold war or hot war into the country, won’t allow any country or force to create war or stir up trouble
- We countries in the Asia-Pacific have the ability to resolve tensions among ourselves; we despise coercion from outside hegemonic powers

Senior Colonel Zhang Chi, an associate professor at the National Défense University of China said “U.S. differ in security concepts: Big vision vs. small circle” compared with the United States, China emphasizes that stopping war is the true craft of war, and the purpose of developing military power is to stop war, rather than using it to achieve political goals. America’s concern has always been the Asia-Pacific alliance system it has built, while China looks at world security issues from the perspective of “common security.”

Zhang Chi, associate professor at the National Défense University of China mentioned that “In the Western world, people believe that if they have differences that cannot be resolved by political means, they can resort to force. But in the Chinese culture, we have to prevent conflicts”.

US Secretary of Defence Lloyd Austin said that the achievements together

33 <https://www.globaltimes.cn/page/202406/1313470.shtml>

over the past three years reveal something even more fundamental about this region's future. The new convergence is producing a stronger, more resilient, and more capable network of partnerships. And that is defining a new era of security in the Indo-Pacific.³⁴

- Today, we are witnessing a new convergence around nearly all aspects of security in the Indo-Pacific. This new convergence is not a single alliance or coalition, but instead something unique to the Indo-Pacific—a set of overlapping and complementary initiatives and institutions, propelled by a shared vision and a shared sense of mutual obligation”
- This new convergence is about coming together, and not splitting apart. It isn't about imposing one country's will; it's about summoning our sense of common purpose. It isn't about bullying or coercion; it's about the free choices of sovereign states. And it's about nations of goodwill uniting around the interests that we share and the values that we cherish”
- Now, at the heart of this shared vision is a set of common principles. Countries across the Indo-Pacific, including the United States, are converging around these enduring beliefs: respect for sovereignty and international law. The free flow of commerce and ideas. Freedom of the seas and skies. And openness, transparency, and accountability. Equal dignity for every person. And the peaceful resolution of disputes through dialogue—and not coercion or conflict. And certainly not through so-called punishment.

These principles are widely shared. They are vital. And we have all seen the consequences when states choose to violate them.

Ukrainian President Volodymyr Zelensky's attendance of the Shangri-La Dialogue remind Asian countries to not fall for a similar trap that the Ukraine had fallen into as the instigation of the US for bloc confrontation in Asia. His presence comes just weeks ahead of a Ukraine-backed peace summit slated to be held in Bürgenstock, Switzerland amid a mounting urgency for Kyiv to bolster international support for its peace plan – China will not attend stating neutrality but it is more of its relations with Russia.³⁵

The conflict, though a continent away, has been watched closely by governments across the region, especially those contending with territorial disputes with another military and authoritarian power in the region, China.

Of the invited 160 countries and organisations, more than 100 countries and organizations will be attending the Ukraine's peace summit. The US will be represented by Vice-President Kamala Harris, while Russia is reportedly amongst those not invited. China has criticised the conference, saying it would be “difficult” for it to

34 <https://apnews.com/article/shangri-la-dialogue-austin-china-taiwan-philippines-defense-46868bec3799f5043276d9f-deca62a41>

35 <https://www.bloomberg.com/news/articles/2024-06-01/shangri-la-latest-marcos-aims-at-beijing-over-south-china-sea>

attend if ally Russia did not participate. Beijing has also denied accusations by Zelenskyy that it was trying to prevent other nations from attending the summit.³⁶

Though Zelenskyy's presence in the Sangri-La Dialogue, more than half of the 10 member-states in the Association of Southeast Asian Nations (ASEAN) Malaysia, Vietnam, Brunei, Cambodia, Laos and Myanmar look set to miss a global summit. Russia of trying to disrupt the peace efforts and China of sabotaging efforts by threatening countries with higher fuel and food prices should they attend the event.³⁷

India is the only South Asian country to attend Swiss-hosted Ukraine peace summit.³⁸

China, North Korea and Russia relationship including bolstering Russia's defence industrial base with dual exports and supply of munitions in the recent months is aimed against the West and is widely seen to have impacted the security climate in Asia. The divisions between China and the West are deepening over Beijing's close Kremlin strategic partnership ties.

Austin raised the exports issue during a meeting with his Chinese counterpart Dong Jun. Austin indicated to China that there would be consequences if Beijing continues to support Russia militarily. Dong said China, which claims neutrality in the conflict, had honored its "promise not to provide weapons to either side of the conflict" and has strict controls on dual-use exports, according to China's spokesperson.³⁹

Three Insinuation communications

- The need and the success for China and US to talk though the frequency of security dialogues weather bilateral or multilateral, weather track 1. Track 2 or track 1.5 is not a reliable barometer of the Sino-US relations.
- The Europe incident could happen in Asia
- China's global influence with its anticipated participation in the Ukraine Peace talk and supply of weapons to Russia

South Asian Regional Geopolitics and Militarisation

India's per capita GDP was almost the same as China 40 years ago. China's is now five times that of India. India has overtaken as the most populous country in the world. As of Forbes India May 2024- China and India are third and fourth most powerful militaries in the world. Pakistan ranks ninth. Three nuclear states with militarisation in the Himalayas.

China and India relations is politically competitive, economically cooperative

36 <https://www.aljazeera.com/news/2024/6/15/world-leaders-meet-in-switzerland-as-ukraine-seeks-aid-amid-war-with-russia>

37 <https://edition.cnn.com/2024/06/15/europe/ukraine-peace-summit-switzerland-intl/index.html>

38 <https://www.sarkaritel.com/india-only-south-asian-country-to-attend-swiss-hosted-ukraine-peace-summit/>

39 <https://www.usip.org/publications/2024/06/three-troubling-takeaways-us-china-relations-shangri-la-dialogue>

and militarily confronting. Peace in the region is not just about absence of conflict, but presence of justice, equality and mutual respect.

The Economic Times of 12 May states that China has emerged as India's largest trading partner in the FY 2023-24 with \$118.4 billion two-way commerce, narrowly edging past the US, according to the data of economic think tank Global Trade Research Initiatives (GTRI). The bilateral trade between India and the US stood at \$118.3 billion in 2023-24. Washington was the top trading partner of New Delhi during 2021-22 and 2022-23. India's exports to China rose by 8.7 per cent to \$16.67 billion in the last fiscal. Imports increased by 3.24 per cent to \$101.7 billion.⁴⁰

India election and Modi 3.0

With 969 million eligible voters more than 650 million participated in the 18th general election which were held in India from 19 April to 1 June in seven phases, to elect all 543 members of the Lok Sabha. Modi's failure to win outright majority has accepted a setback of brand Modi, a return of coalition politics, a jolt to the dominant Bharatiya Janata Party (BJP) and resurgent opposition. BJP claims victory but short of majority.⁴¹ Domestic politics does impact regional and geopolitics. Five messages are on hand that status is always temporary in a democracy. Two, the principle of inclusivity plays an important role in multicultural multiethnic multi lingual societies. The domestic political environment does impact policy with "Neighbourhood First" policy in South Asia and other geopolitical concepts like the "Act East" policy, "think West" policy, "Security and Growth for All in the Region" (SAGAR) or "Connect Central Asia" policy. India will stride in international relations with strategic autonomy with multi-alignment policy. Lastly, foreign policy prevalence with national goings than the day-to-day government.

Conclusion

Rivalry between China and the US has become a paradigm of international relations more over the past two years. It shapes both strategic debates and real political, military and economic dynamics.⁴² The war in Ukraine is transforming Europe. Strategic events occurring from European Parliament elections marked a surge for right-wing parties across the continent; North of the Alps: As the World leaders meet Volodymyr Zelensky to explore ways of ending Russia's war in Ukraine, Putin lists Russia's conditions for peace talks with Ukraine, which include Kyiv dropping its ambition to join NATO and handing over four province to Russia. Ukraine took about a second

40 <https://economictimes.indiatimes.com/news/economy/foreign-trade/india-in-trade-deficit-with-nine-of-top-10-trading-partners-in-2023-24/articleshow/110437028.cms?from=mdr>

41 <https://apnews.com/article/india-election-results-2024-lok-sabha-modi-bjp-7893efec83fa8225a611f174e6420ee>

42 <https://www.swp-berlin.org/10.18449/2020RP04/>

and a half to reject Putin's suggestion. China is not attending, despite heavy lobbying by the U.S. and others to show up, and is pushing a rival peace plan. South of the Alps: The G7 meeting in Italy served a mixed grill of policy positions. Leaders pledged to tackle what they said are China's harmful business practices and agreed to provide USD50 billion of loans for Ukraine backed by interest from frozen Russian assets. With France, Germany, and the United Kingdom facing domestic political turmoil, and the possibility of a second Trump term hanging over the NATO alliance, Europe's political future seems far from certain.

Timothy Garton Ash a historian wrote in "Post-imperial Empire" How the War in Ukraine Is Transforming Europe that if the European Union wants to preserve its large and diverse political community in the face of dissension from within and threats from without, it will need to strengthen its central authority and gather in defence of shared interests and values—to become, in other words, a "liberal empire". The continent must do so, he argued, "to prevent the comeback of a declining Russian empire and constrain a rising Chinese one."⁴³

The dimensions of Sino-American competition over power and status include growing threat perceptions and an increasingly important political/ideological component.

China aims to introduce "legitimate security concerns" as global legal principle. These could qualify as exceptions for the principle of sovereignty.⁴⁴ According to this interpretation, Beijing fundamentally challenges the existing international order.

Under Xi, the GCSF has evolved into the key China narrative of a global order free from institutionalized asymmetries favouring Western states. With the global initiatives, Beijing projects its domestic approach and serves as the umbrella of foreign policy focused on establishing China dedicated networks around a broad area of policy areas including cyber, health, law-enforcement cooperation, green tech and agriculture policymaking to the global level with BRI as a crucial element to implement GCSF. The GSI, GDI and GCI are concretization steps of the GCSF. But in essence GCSF concept remains fluid and ill-defined but relies primarily on abstract concepts like win-win cooperation and network of legally non-binding Memorandum of Understandings (MOU).

While China promotes the BRI as a global initiative, it prioritizes states from the "global South" and states of the "Non-Alignment Movement". Advocation for an alternative model of governance that prioritises economic

43 Postimperial Empire: How the War in Ukraine Is Transforming Europe (foreignaffairs.com)

44 http://vienna.china-mission.gov.cn/eng/mtjj/202404/t20240417_11283456.htm

development and rejects the centrality of protection on individual rights and Western democratic processes began with global South Characteristic at the peak of China's economic growth toward the end of the 2010s.

The key elements of the GDI are common and green development, reflecting domestic priorities with aims to put "development" to the 2030 SDGs at the centre of the UN system. Potential implications of the GDI: prioritizing the state of the individual. The GSI, prioritizes "indivisible security"⁴⁵ to overcome a Cold War Mentality calling it an outdated security concept. Completing the trifecta, in March 2023, the CN leadership introduced the GCI. It promotes the "modernization does not mean westernization" narrative, implicitly questioning "universality" claims by Western governments like the international human rights regime.

In Deng Xiaoping's own words in 1985, "Our reform is an experiment not only in China but also internationally, and we believe it will be successful. If we are successful, it can provide some experience for developing countries". In Xi Jinping's own words in 2017, "the system...of socialism with Chinese characteristics have kept developing...It offers a new option for other countries.. who want to speed up their development. It offers.. a Chinese approach to solving the problems facing mankind"⁴⁶.

The future of power diffusion of power globally is potentially a greater threat than power transition.

The Geopolitical landscape and navigating the geopolitical chessboard for prosperity and stability of IPR and South Asia is of concern. Modi's emergence for the third time with South Asian geopolitics and militarisation has implications in global politics. Domestic political environment is constant for China, while November US election encompasses diverse favourable and unfavourable foreign policies speculations for Europe and the IPR. The long and great game is of the rivals and the middle powers crisscrossing on global governance and regional geopolitics is on the intensification requires careful choices with unfolding conflicts falling into the strategic trap when foreign policy of the US and allies is aimed at responding to China's eminent emergence and the middle powers like India is rising. China and the US with competing visions of global governance bears implications so balancing competing visions for global governance may be choices. Calculating on the categories of development initiatives bilateral and mini-lateral cooperation can be the right preferences.

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45 <https://www.globaltimes.cn/page/202203/1254890.shtml>

46 <https://www.atlanticcouncil.org/in-depth-research-reports/report/a-global-south-with-chinese-characteristics/>

Interface between Geopolitics and Development in Nepal

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Introduction

How does geopolitics impact development or are developmental initiatives from outside always geopolitically motivated? Understanding the interface between the two is important for the reason that both are often found intertwined. Both development and geopolitics were merged with each other when Harry Truman the, then, American President came out with point four programme¹. The programme essentially came as part of foreign policy objectives. Its immediate impacts were such that it divided the entire world into two categories – developed and under developed – which created its own type of classes within the comity of the states. Those who were classified as developed were put on the top priority for development, at least in principle, and prescriptions were developed for them and were asked to adhere the process accordingly. Since then, development as a terminology has entered into political communication in such a way that no political speech or public discourse would complete without uttering it in one way or the other. Nepal certainly comes into the categories of those countries.

To begin with, Nepal's modern developmental laboratory was set up by the external powers. In that regard, United States becomes the pioneer in taking up such initiative in 1951². This was followed by other countries including India, China, and the former Soviet Union. These countries, along-with other actors (state and non-state), have emerged as the major shareholders of this laboratory over the years. In that regard, since then, outside support both in the form of aid and soft loan has been pouring in from bilateral, multilateral, and other organisations as well. A closer look clearly reveals that seven plus decades, billions of dollars investment, and thousands of years of expert advice have been rendered. At hindsight, one may find twin objectives of such an effort (a) to support Nepal so that it can also catch up with other countries – the benevolent approach under the framework of liberal internationalism and (b) those donor countries/actors have also had to fulfill their own geopolitical objectives through foreign policy tolls.

1 The Point Four Program was a technical assistance program for "developing countries" announced by United States President Harry S. Truman in his inaugural address on January 20, 1949

2 The four point program agreement signed between Nepal and the US on 23 January, 1951 heralded Nepal's first experience of foreign aid assistance.

That being said, of course, since 1951, till today, Nepal's economic size has increased, the per capita income has increased. Nepal has made significant achievements in the field of education, healthcare, infrastructure development and even other indicators such as the gender gap, which is the most talked about issue in any country, has decreased. Moreover, Nepal now is well connected by roads and electrification of rural villages is under way. Nepal's communication infrastructure has significantly improved. Nepal is on the verge of graduating from the status of LDCs and would join the club of (sic) developing countries by the year 2026. While putting them together, we can argue that they are not small achievements by any standard. It seems that countries like Nepal began 'moving ahead' on the path of modern development only after 1950s. By and large, development has reached to the villages but this model of development has its own flip sides as well. For example, as it reaches there, by then, most of the people have migrated to the urban centres and from their outside of the country. Today, more than one fourth of Nepal's total population lives outside for their livelihood. There is some sort of mass resignation of people from state and society and pessimism is brewing up very strongly. Circumstances as they stand, certainly raises some fundamental questions on the very nature or model of development and trajectory it has created for state and society. Many factors could be held responsible for reaching to the point as it is now. Yet there are those who claim that geopolitics may have been the one as both are intertwined with each other. What may still be important, however, is to look into the dynamics between the two, that is, how the narratives of development have shifted, over the period of time, in the key historical junctures such as the end of empire, during the Cold War and after the War on Terror, and recently with the rise of emerging powers in the world politics. Moreover, with every political change (both systems change and regime change) there has been subsequent changes in the model of development as well. In that regard, there are those who also argue that most of these political changes are also externally induced in one way or the other. Interesting as it may be, changes in the domestic politics is also coincided with subsequent changes at the global level. They also bring deep consequences not only for development but also found to have been (re)shaping societal interactions as well. The overarching aim of this article, however, is how global geopolitical rivalry has been reflected in Nepal's developmental initiatives.

Conceptual framework

The idea of development was ushered in at a time when legitimacy of the colonial rule was in rapid decline. Those colonial rulers have been dominating the world politics for a long period of time. However, second world war has forced them to have some mechanism of governance at the

global level. For them, there was a need to maintain some kind of status quo, at least, to maintain their influence, if not to enhance it, in the world politics. Formation of the United Nations and other institutions were set up who would, then after define how politics, economy, and society should move ahead. More importantly, in that regard, the idea of development came out to be blessing in disguise and powerful countries of the western hemisphere have successfully implemented it. In fact, it is this idea of development which has been shaping and managing socio-economic affairs of those countries around the world. No other ideas have been as effective as it is in changing nuances of the society in more than one way. For the colonial powers, maintaining influence was becoming difficult primarily because at the end of the second world, it was also the time when the idea of formal sovereignty was taking its root and having direct control of any state(s) big or small is next to impossible. What certainly needed in such a state of affairs is to “neutralise” the sentiment of sovereignty and put them on the path of development. Such an endeavor would increase their loyalty towards those powerful states as every country wanted to be developed and be like them. Apart from that the idea of development was also helpful to contain the spread of communism and consolidate the long-term influence³ which, then, was raging the world. This certainly was needed in Asia with the communist takeover of China in 1949. While development, then, was used to contain communism, wherever it is needed, and spearhead development to control the new decolonised states as well as other so that they can be kept in the right orbit. The instrumental use of development has, over the period of time, has turned it only into geopolitical tool which has been manifested in various forms. There certainly is an interesting interface between the two. Scholars argue that all conceptualisations of development contains and express a geopolitical imagination which conditions and enframes its meanings and relations⁴.

Moreover, development to a great extent is also linked with modernisation process. Among others, it is also the idea of modernisation which provided framework conditions for development. Hence, we can argue that development and modernisation are closely interlinked. While development is a broad concept that can be defined as a positively evaluated process of change across social, political, economic, and cultural spheres of life, modernisation, for its part, is a process to achieve those developmental goals. Moreover, modernisation also refers to an attempt to foster modernity—and modernity was typically defined in line with western ideas, outlooks, institutions, and world views, which were contrasted against traditional ideas and structures

3 Power, Marcus (2019). *Geopolitics and Development*. Routledge

4 Ibid

within the society being modernised⁵. Alternatively, development is an end goal to “civilise” those seen as “backward” through modernisation process. The entire philosophy of this discourse, however, has its root in the western civilisation based on what they call enlightenment and all other societies will have to be modern as per that enlightenment tradition. By enhancing the idea of modernity, west certainly can have edge over the geopolitical battles around the world.

With regard to the idea of enlightenment, the west European philosophers have made great contribution but with regard to the development and its other paraphernalia including the liberal values it has always been the US. This perhaps could be the reason, among others, why Americans have dominated developmental discourse around the world which has not only allowed to shape the policies but also secured legitimacy of a liberal world order. This approach was also helpful both for the nascent United Nations and one of its prominent specialised agencies, the World Bank. Modernisation policies were in play during the transition from world war to cold war⁶. President Harry S. Truman’s Point Four Program that we have mentioned earlier played a key role in that regard. Point Four programme as a fourth foreign-policy goal which, in principle, promised U.S. technical aid to promote modernisation at the global level - a codification of policies that had been gestating since before World War II. The program included initiatives that were instrumental in creating what had not existed before: formal and permanent foreign-aid bureaucracies within the U.S. government that had a global mission. These eventually grew into and what has then become the United States Agency for International Development (USAID) and other supporting organisations⁷. To explain this expansion of activity, the school of modernisation theory emerged in the American social sciences with an assumption that all societies were converging on the sort of modern, industrial life that was exemplified by the West and by the United States in particular. One of the more famous exponents of modernisation theory was Walt W. Rostow, an economist whose leading work, *The Stages of Economic Growth: A Non-Communist Manifesto* (1960), posited an evolutionary track for countries to follow to become modern, high-consumption societies. Rostow’s book was meant as an explicit counterpoint to Marxist theories of development and displays the ideological competition at the heart of much U.S. modernisation activity. In fact, it was the modernisation theory which suggested that countries like Nepal can only develop or become economically prosperous and socially cohesive, if they modernise⁸, surrender their values and pursue the path of

5 Power, Marcus (2019). *Geopolitics and Development*. Routledge

6 Ibid.

7 Ibid.

8 Sripati Vijayashri (2020) , *Constitution-Making Under UN Auspices: Fostering Dependency in Sovereign Lands*. New Delhi. Oxford University Press.

development⁹. Both development and western modernisation became so attractive that even the communist countries like China and Marxists of all shades and colours started adhering it which ultimately eased to expand the geopolitical interests as well. Among others, this certainly is the reason why reemerging power of today are also using development to advance their geopolitical interests both at the neighbourhood and beyond.

Nepali Context

How should we understand Nepal's developmental process? How has it transformed with subsequent changes in the global and national politics. How should one understand the interface between development and geopolitics within the context of Nepal? In fact, discourses on development and its Nepali equivalent VIKAS which has entered into all spheres of state affairs as well as at the people's level so strongly that it has left no areas untouched and no political speech or conversation whatsoever are to be completed without uttering the word 'development'. The word has also gotten prominence in the common parlance in many ways. Yet in the course of time, VIKAS adopted various tumultuous routes since 1950 when it first entered Nepal. That being said, this does not mean that, VIKAS as we understand today may certainly have been happening even before that but we may not have used the same terminology to explain those human activities as we do now. Yet the etymology of the word itself is problematic and confusing to the core as it has more than one meaning. What is true, however, is that discourse has gripped all of us.

As indicated earlier, every political change both within and outside of the country have had deep impact on Nepal's development discourse and process. For example, global political change in late 1940s, 1980s and the first decade of the 21st century did have great deal of impact on our own political system. And global political changes are not only political, they also bring economic and social changes as well. This began right from early 1950s when Nepal, as they say, was opened up to the outside world. Interestingly, that world, also went through major metamorphosis whose impact are well reflected on Nepal's polity as well. Firstly, during early days of the Panchayat (King Mahendra's period), the whole idea of VIKAS was linked to industrial development and economic prosperity through it. It laid greater emphasis on the development of villages. State, then, had a sanguine view that VIKAS can only be realised when villages become prosperous. King Mahendra was not in favour of ideology led development. For him, both capitalism and socialism, the two prominent ideologies of that time, would not serve societies like Nepal. He was, perhaps, mindful of the fact that such ideologies are largely materialistic and may not be suitable in a society which is deeply

⁹ United Nations Report on Development, 1951.

spiritual. For that reason, he rather preferred to bring good parts of all those ideologies available in the market and tried to strike a fine balance among various factors. For him, only the natural amalgamation between the political system (suitable to the soil – then, Panchayat) and economic policies can lead to the equilibrium – which is important for development¹⁰.

Secondly, when King Birendra came into power, he was more influenced by the political jargons floated by the Western development experts and policy-makers. It was during this time when phrases like bikashit, alpa-bikasheet, bikas unumukha, bikashsheel, bikasko shikar, aadharbhit aabasyakta, vikashko mulfutaunae and alike dominated discourses. Most of them were part and parcel of point four program which came up with its philosophy of development. It is certainly not surprising, King Birendra, like others of that time, whole heartedly, adopted the western ideals. For many it was also a time when VIKAS per se appeared as a new Avatar. Nepal's entire developmental planning mechanism has been influenced by this. The structural adjustment programs (SAPs), which Nepal adopted in 1980s, were the product of this phenomenon. The flexible and market-driven development comes into the centre stage to foster private sector, NGOs, civil society groups, local federations (Char Pate Clubs) were among them. Likewise, de-bureaucratisation of development becomes top priority which ultimately led to the growth of critical masses required for social change and breakdown of the hierarchy of the state. However, such an approach neither strengthened state institution nor has it enhanced development, in contrast, it only subjected Nepal in multiple ways and prepared ground for yet another regime change. In that regard, 'Panchayat' as political system becomes its first victim. With the fall of Panchayat, Pandora's Box was opened to such an extent that overwhelming number of actors appeared in the Kshetra of Vikas. Like many other countries from the, then, third world, Nepal officially embraces liberal polity and enters into the third phase of development wherein neoliberal agendas focused on 'reinventing government, state, and 'society'. Despite knowing its consequences, Nepal continued with such policies for the fear that international support would not be there. Reinventing government had discarded state's role in development and also to serve the public welfare (ibid). Nepal lost its autonomy in the realm of policy-making. Development experts and policy makers came up with an idea of 'good governance' for the purpose of service delivery and too much of emphasis was put on the private sector. Such a state of affairs has diluted the very sense of the state. With the passage of time this can, conversely, evaporated¹¹ people's euphoria for patriotism, democracy, and development and could even trigger mass resignation of people – both from the state and the society. In fact,

10 Bhatta, C.D. (2017). Critical Appraisal of Foreign and Development in Nepal. FES/TU

11 Ibid.

all these elements have exposed the contradiction between democracy and liberalism thereby forcing people to question the very concept of democracy and development. They together contributed in developing a rentier state¹². Yet there was a deep contradiction between market-based liberal economic policies and constitutional provisions of welfare state. The mismatch between the two has led to the rise of Maoist insurgency in the country which finally dethroned Nepal's 400 plus years of monarchy and one of the oldest dharma – sanatan dharma and moved completely towards materialistic state.

Fourth, after the regime change in 2006, new modus vivendi comes into place. Inclusion and right-based approach (RBA), and people's participation becomes the corner stone of Nepal's developmental approach? Federalism has been introduced as a new means of decentralization of not only the political power but also the economic power. One certainly can notice fundamental shift in the developmental priority and discourse in Nepal until 2015 (when the constitution was promulgated). This certainly has contributed greatly but it has also tension between state and society and majority and minority groups within the country. The 'soft issues' have been projected as an obstacle for the development and much of the energy was spent on social engineering as an endeavor to restructure the society. Paradoxically, the economic activities within the country fell short and outbound labour migration becomes top priority of the policy-makers with regard to the employment. Yet the earthquake in 2015 in Nepal and its coincidence with the heightened geopolitical rivalry in the region between resident and emerging powers have brought fresh impetus to the developmental debate. Connectivity and infrastructure development become top priority for all the donors. Each started criticising others developmental model/approach. In contrast, all major components of development such as aid, trade, transit, transportation, and market are geopolitically tied up but Nepal failed to define its own developmental path. The intergovernmental organisations, too, were aligned accordingly. The social engineering projects were sub-contracted to NGOs/CSOs.

Decline of state and rise of non-state actors

The portrayal of NGOs as the 'pole of virtue', and state and its agencies as the 'incarnation of evil' has created different dynamics. Many western experts and policy-makers thought that states in the global south are not capable enough to steer the developmental activities. And development can only happen when NGOs and CSOs can take a lead. Western donors have created such conditions they have mobilised their NGOs/CSOs in aid recipient countries not only to implement but also to define the pathways for

¹² Ibid.

development. Such an approach certainly has led to the growth of NGOs/ Cos but people's confidence on state began weakening in multiple ways. This bifurcation has led to the growth of what scholars refer as 'divided sovereignty'¹³. While divided sovereignty appears to have eroded legitimacy of the state, NGOs and civil society organisations, for their part, found themselves in a buoyant position for their increased role in framing state policies. Such a model of development has been criticised, at least, for two obvious reasons (1) it only emboldens the role of non-state actors and (2) such actors only tries to legitimise their own agendas thereby creating vast gap between what is real and what unreal with regard to development. Some of their developmental agendas were also laden with geopolitical objectives. In fact, on many occasions, civil society organisations started shaping the geopolitics and geopolitics promoting CSOs for that purpose. What transpired is that such a state of affairs have increased dependency of state on donor, society on NGOs which only cultivate space for the geopolitical maneuvering. But the fact remains that modern development, largely externally induced, has been largely seen as the geopolitical project. Of course, the externally induced approached has significantly contributed to uplift the socio-economic conditions of the countries around the world but they are not free from the criticism. This is only led to the creation of space for geopolitical maneuvering.

Development, which in the past used to be the sole prerogative of the state, has brought multiple actors in the fore in recent times. Not only the actors, it has also embraced various approaches. The crux of the matter, however, is that all these efforts have not really brought positive changes into the life of people. Still, there is no denying that the comforts, which were just unthinkable some 25 – 30 years ago area easily available to the people today. This certainly is a marvelous achievement. This point, which cannot also be missed out is the mass exposure to IT and social media which certainly has scaled up people's awareness irrespective of their physical location. Nevertheless, the issue, at the heart of the discussion, first, is the widening inequality and triumph of capitalism over humanity and second, is the discontents and demands, which are soaring higher than the achievements. All these have rendered the present level of development meaningless for the reason that the comforts and material achievements have not be able to douse the level of dissatisfaction that exists in societies. Such a state of affairs raises some fundamental question such as 'how we reverse this cycle' should we reinvent the wheel or do anything else'. Moreover, who would be the appropriate authority/agency to carry out developmental activities; state actors, non-state actors or international agencies.

13 International Security, Vol. 29, No. 2 (Fall 2004), pp. 85–120

The main debate, however remains was what should the role of the state vis-à-vis development and agendas thereof. Whatever the case may be, largely, states role has been marginalised . many saw the state and existing state structure obstacles for the development. For them ‘right sizing’ of both is essential so as to put development on the right track. This means the while restructuring of the sate and society (including its cardinal values). In that regard many (i)NGOs took the responsibility ‘civilising’ the state and the society. This has not only led to the privatization of development but has also derailed the while process of development. In fact, nearly three plus decades of development process in Nepal has only privatized the state’s welfare functions and erosion of the community institutions (Shah , 2001).

Development as a recipe for disaster ?

When we talk about development from outside – foreign aid/assistance/agencies – comes into the mind and many argue that it has not really promoted symbiotic relationship wherein one benefits from the other for their mutual coexistence. But this certainly has not been the case. The relationship, in contrast, is anti-symbiotic wherein one thrives at the cost of other. One may come up with many reasons for such a state of affairs. The most pertinent one, among others, is that the development policies it envisages and influence it exerts on the entire system (political, economic, and social) - which ultimately falls apart. The misplaced polices and priorities only accelerate the ‘process of mutual poisoning’ of each other. In the context of Nepal, the economic growth in the cities appears to have been destroying the economic structure of the hinterland. Hinterland, as riposte, takes revenge through mass migration into cities. Such interaction between the two such is that both hinterland and cities become unmanageable¹⁴. This truly exposes the contradiction that modern development carries. While, in principle, it aims to improve the livelihood of the people both in the hinterland and cities but that does not really happen in the real sense of the term. In a state like Nepal, such a model of development has only created chaos for all and people’s confidence on it is waning. Perhaps, either the idea of development is seriously flawed or Nepali elites have no intension or will to bring about some positive changes in society.

Majority of the planners and policy-makers have thought that development could be achieved only with the outside assistance. And they have franchised alien theories and dismissed our own heritage and tradition of development. They, in tandem with foreign counterparts, have sprinkled jargons which are neither easy to understand for common people nor can they resolve our problems. The erroneous in their outlook and judgement have forced Nepal to adopt various development’ theories as gospel truth. In fact, extant

¹⁴ Schumacher, E.F. (1973). *Small is beautiful: study of economics as if people mattered*. London. Vintage

developmental approaches in recent times, are going to lay waste of our village system and village culture in a planned manner and disconnected society from the state. This is how development has failed to unite Nepali society. This has also brought some sort of erosion on our sovereignty by creating a 'state within the state'. The haphazard conversion of villages into municipalities is truly dismantling our village Swaraj.

The chaotic adoption of development policies by the successive government since 1950 has made many countries, including Nepal, laboratories to test development theories one after another and have ultimately reached to the point of no return. Most of these theories merely criticize the extant way of life and try to impose their own perception. Development for some is building infrastructure, while for others is all about public services. Yet there are others for whom development is to get rid of the existing situation (values etc). and emulate the values of theirs and so being 'modern'. Still, some others argue, it is all about being modern or post-modern. In such a state of affairs, it is confusing as whether development is about mobility (from one state to another) or prosperity. The impact of development can also be very well felt in the 'geography of the nation'.

The ideology of VIKAS has caught us up in such a way that it has become very difficult to get rid of it. The development debate has enslaved many of us to such an extent that we do not trust ourselves and do not know exactly what we wanted to do in the name of development. The whole debate, so far, has made us inferior. The post-developmentalists, perhaps, are right for their emphasis to go away with all theories of development. For them, these theories, by no means, have helped to move ahead. They have, rather, reinforced dependency day-by-day. The classic example here is that until late 1970s, Nepal used to export agri-products but with the adoption of more sophisticated theories of development, its dependency to the outside world have skyrocketed. For multiple purposes. The migration taking place in an epic scale is the failure of development policies that Nepal emulated over the years. Nepal today has transformed into a consumer state and its potential to be self-reliant has been reduced to ashes. Such a situation truly manifests the symbols of peripheral state serving the interests of core. If it continues like this, any children whoever born in this country will not get a chance to serve his or her own country once they grow up.

The Rise of New actors/issues

For much of the post-war period, the old global hegemony like the US, western European countries, and the USSR were drivers of the global economy and trustees of international development. They were the one who have been shaping international development both in theory and practice¹⁵. Yet all is not

¹⁵ Marcus Power (2019). Development and geopolitics. Routledge.

well with this approach. Criticism are abound against development theory and practices. With the rise of “new” state donors from the global South (such as China, Brazil and India on one side and west Asian countries on the other), the traditional hegemon’s influence is waning and modes, manners, and patterns of development cooperation is also changing. The rising powers from the global South are shouldering greater role in the global economy and international politics thereby reversing the ontological hierarchy of Northern donors and Southern recipients¹⁶. What is still important, nevertheless, is that the rise and fall of the “Third World” as a geopolitical category and subsequent rise of the South has led to the emergence of what scholars call the “securitisation of development” (and “developmentalisation of security”)¹⁷. There can be two arguments behind this securitization (1) security imperatives generated by the post 9/11 era which mirrored ‘underdevelopment’ in any part of the world is dangerous “dangerous” for their own stability (emphasis added)¹⁸ (ibid). This has been marked by increased investment from the western donors not only in the areas of software development, as part of modernisation of societies and values, but also in the areas of hardware development (ibid). Second argument is that west felt potential threat of displacement from the centre of global politics/economy with the rise of the rest. Such thinking has securitised the internal development cooperation as well and geopolitics comes into the centre stage.

Moreover, the rise of the new powers from the global south, has already challenged the fact that development can only happen from the northern donors. In that regard, China and India’s role is particularly notable. Their rise, for all the practical reasons, have not only reduced the dependence of many under developed and developing countries from the global south on northern donors for their development. Apart from that they, too, have begun reshaping the discourse itself¹⁹ which is more important than the financial support. Today in many countries of the global South China and India are the top investor in in the filed of infrastructure development. While it has created insecurity for the northern donors, southern donors, for their part, took this as an opportunity to reclaim their positions in the world politics. Its consequences, however, are such that it has brought both northern and southern donors in the direct competition and confrontation in many countries of the global south. The classic example in that regard is the case of Nepal where China and the US have openly come up with their own shows. They started wielding their swords in the street of Kathmandu – a classic geoeconomic rivalry.

16 Marcus Power (2019). Development and geopolitics. Routledge.

17 Ibid.

18 Ibid.

19 Ibid.

The juxtaposition of geoeconomic and geopolitics has brought fundamental changes in the development cooperation. All the powerful countries (whether they are old or new) have brought their geoeconomic instrument(s). China's a trillion-dollar project framework under Belt and Road Initiative (BRI), and its intention to push developmental activities in the world through Global Development Initiative has changed the development debate. To counter it, the and its allies have come up with Indo-Pacific strategy along with another US-led G7 Partnership for Global Infrastructure and Investment (PGII) and the EU's Global Gateway. While the two initiatives share many priority areas (i.e. climate change, COVID-19 recovery, digital infrastructure, healthcare, gender equality), the US offering emphasizes 'soft infrastructure' while the EU's focuses more on physical infrastructure within the transport sector²⁰. India, too, is trying to reinforce its sphere of influence in South Asia and beyond. It has scaled up rail and road projects, which earlier remained in the backburner, connecting from the Southern region of Nepal to Kathmandu – the capital city. Taken together, whatever the case may be, their rise certainly has increased confidence levels of many states of Asia, Africa, and around the world – who otherwise were fixated on the West for both development and democracy. Their rise, however, is also creating complications for relatively smaller states of South Asia to keep strategic balance in their international relations. There are opinions, which posits that on many occasions powerful states of the region and beyond may use smaller states as the 'launching pads' to serve their own interests. While their involvement in Nepal might have a potential of creating opportunities, as we said earlier, they have also unleashed implications of critical geopolitical salience, particularly for Nepal – a country with a history of chronic political instability. There are evidences, which show that 'international geopolitics' has a huge influence on domestic politics in Nepal, even on inner-party dynamics – possibly to a higher degree than might be good for the country. And not just a few miss a long-term strategy, since many moves of the political elites seem to be rather guided by the outlook to immediate political gains than the long-term interests of the country.

The geopolitical rivalries in the Himalayan region and the Indian Ocean have brought its own kind of predicament for the smaller states. The competition among major geopolitical actors is manifested in more than one ways and smaller states like Bhutan, Nepal, Sri Lanka, Maldives, are undecided with whom to align. For Nepal, it cannot ignore the US offer – a partner in development for nearly seventy years – along with its allies (the west plus). Similarly, it cannot also afford to sideline its immediate neighbours with whom

20 The White House (2022), 'Memorandum on the Partnership for Global Infrastructure and Investment', 26 June 2022, <https://www.whitehouse.gov/briefing-room/presidential-actions/2022/06/26/memorandum-on-the-partnership-for-global-infrastructure-and-investment> cited in <https://www.chathamhouse.org/2022/12/building-global-prosperity/03-geopolitics-development> (retrieved on 19 July, 2024).

it shares cultural and civilisational ties. Nepal certainly needs international assistance for development and job creation, but, at the same time, it has to strike a fine balance between fast rising neighbours and others. As the seminal analyses of Leo E. Rose claims in its title: Nepal has historically been successful with applying a 'strategy for survival'. Nevertheless, the quest of today lies beyond that. In fact, Nepal's 'strategic location', natural beauty of the snow capped mighty Himalayas, and somewhat underdeveloped nature of the economy has always invited 'multiple' actors – both state and non-state – who have had their own sets of agendas. Increasing movements of various actor demands balanced foreign policy nevertheless, it is becoming Achilles hill to have the same. Nepal, truly, is in dilemma as how it should deal with 'old power(s)'- the US - and the 'new' emerging powers' – India and China – at a time when its dependency towards outside world has phenomenally increased.

New Geopolitics and Development:

The shift in the global economic architecture from Brettonwood to the Buttonwood – where crypto currency and artificial intelligence will become the dominant factors. There is a great deal of need that nation-state understand these changing dynamics and develop new framework as it is creating new fields of geopolitical battlefield. The new geopolitics that have recently emerged, as indicated earlier, is not only limited between the states. There are multiple actors – state and non-state and multiple issues. The new geopolitics is forcing societies like Nepal to transit from one way of life to another, under the influence of materialistic civilisation which have had a lot of money and weapons. This materialistic civilisation, in the past, has always lived in binary (due to its ethnocentric approach) such as men vs God, men vs nature, men vs society, men vs women and now men vs men and is exporting some of their societal problems or they have same imagination of other societies as they have their own and largely influenced by Rene Descartes's philosophy as per whom the goal of knowledge is to dominate human being. Yet the materialistic ideas – capitalism and communism – could neither produce capital nor could they guarantee justice as Marx and many of his followers envisioned. Yet what certainly can happen is the binary way of life, which yet again, will turn everybody against everybody. George Orwell satirically, once said, rich countries do not need anything – the wealth they have can even buy the civilisation, but for those who are not so materially reach, their wealth is their civilisational and cultural values. However, under the influence universalising so called 'civilising standard'²¹ countries like

21 Sripati, Vijayashri (2020). Constitution-Making Under UN Auspices: Fostering Dependency in Sovereign Lands. New Delhi.: Oxford University Press.

Nepal are losing their cultural and civilisational capital²². Similarly, during the Industrial Age, the focus was on the production of materialistic goods, in a post-industrial world, the most important, or ‘hegemonic’ form of production is no longer physical objects²³. Today, overall, in the developed world, the majority of the work is in the realm of ‘immaterial production’²⁴. This includes the making of ideas, memes, narratives, images, financial instruments and social technologies that shape how people form commercial or personal relationships²⁵. This is a significant change, and the new geopolitics will be played around these issues²⁶. In that regard, new geopolitics is also transforming the capital formation process. For example, the biggest taxi company in the world, Uber, own no cars. Like the biggest company for accommodation, Airbnb, owns no hotels²⁷. Yet these companies have been able to develop their own network and control the capital.

Marketisation of development

Developmental initiatives in Nepal have brought diverse actors. The kind of debate it has generated at the various layers of society is noteworthy. Yet the debate itself has not necessarily let development happen. What it has done, in contrary, is the marketisation of development as an idea. Phenomenon of this kind is often termed as ‘development of development’ wherein the development has emerged as an industry employing highly educated people who develop policies to justify their own expertise (Moss 2005). Moreover, all is not well with such a state of affairs. To our dismay, in the process of marketisation of development there is sharp contrast between real issues and imaginary issues. In fact, real issues are sidelined and imaginary issues have become prominent. Apart from that it has also created dependency not only of state but also of society and market itself. Yet development experts perceive that they have made the world and society better. Their efforts have made the world a better place to live in. They don’t stop here, with their expertise, they claim to take us from this side of the river to the other side where the promised land is located. This is the story of development which has ruled the world for the last thirty plus years. What is true, however, is that world has become materially well off but this certainly has not brought prosperity for all. In contrast, the material well-being of past thirty years have led to the growth of rootless cosmopolitans. Many even equate such linear approach of development (production, consumption, and profit, from millionaire to

22 Bhatta, C.D. (2022). Understanding Nepal’s Geopolitical Dynamics: Connected History Disconnected Future. Institute of Foreign Affairs, Nepal: Journal of Foreign Affairs, Vol.2, No. 1, March 2022.

23 Daniel Pinchbeck (2018) How Soon is Now?: AA Handbook for Global Change. Watkins Publishing.

24 Ibid.

25 Ibid.

26 Ibid.

27 Ibid.

billionaire) responsible for populism and cultural backlash in the western democracies. The liberal story of development and free-market capitalism are now in question.

There is need to reform the relationship between democratic politics and the market economy is not driven purely by domestic tensions, important though they are. Even though domestic reform is essential, if we have to strengthen the solidarity on which the health of all societies depends, reform cannot be limited to the domestic. No country is an island. Indeed, never before in history have we so clearly shared a common destiny on our fragile planet. But fear that is lurking is such that they will end up in an Orwellian world of lies and oppression. The ascent of China, whose ruling communist party has rejected the link between capitalism and democracy, has also shaken the confidence of the West and confidence in the West. a liberal democracy is a competition for power between parties that accept the legitimacy of defeat. It is a “civilized civil war.” Force is not permitted. But this means that winners do not seek to destroy the losers.

Conclusion

If progress is all about development, then, there is no end to it. If there is no end it, then, why on earth should we put our state, society, and civilisation in risk. It appears that the time of theory led development has come to an end. Rather than benefitting from it, many countries around the world have suffered from as it does not necessarily understand the local dynamics²⁸. Policies are injected in such a way that they do not make much of sense to the people. Some of these policies are merely come as part and parcel of geopolitical objectives. For that they often capture the National Planning Commission (NPC) – one of the most elite department of the government – that plays key role in the policy-making process.

The health of our societies depends on sustaining a delicate balance between the economic and the political, the individual and the collective, the national and the global. But that balance is broken wherein economy has been destabilised politics and vice versa. We are no longer able to combine the operations of the market economy with stable liberal democracy. A big part of the reason for this is that the economy is not delivering the security and widely shared prosperity expected by large parts of our societies. One symptom of this disappointment is a widespread loss of confidence in elites who come up with ideas that benefits them most. Such a state of affairs has not only led to the rise of populism and conservatism but also division of society along left and right of the political spectrum which has diluted the very notion of truth.

²⁸ Nanda Shrestha (1997). In the name of development. University Press of America.

Nepal's major development partner since 1950s now appears to have been changing their development model and approach. The struggle for influence of major powers in the Himalayas – regional and global – brings many opportunities for the development. However, to turn these opportunities into profit Nepal will need to steer carefully. The stakes, perhaps, are high and it is not an easy task to manage these diverging interests, while maintaining the country's sovereignty and political stability.

If we analyse Nepal's 75 years of development, no doubt, the country has achieved significantly in many areas but it is also the time which has created dependency for Nepal in more than one way. This 'economic dependency' trap can create its own momentum with regard to geopolitics. The dependency trap will continue to flourish if we do not convert the current economic model which is largely service-based not necessarily production based one. The development scholars argue that the development is not always about that only it is also about creation is the most important objectives of the development that has been floated in recent decades. When countries become dependence on theirs they fall into geopolitical and geoeconomic trap. Once they are trapped they cannot really make any decision – politics, policy, and law-making process. That's the biggest tragedy for any nation. "Great misery" says Shookra, "comes of dependence on others. There is no greater happiness than from self-rule".

Development in the Age of Surging Heat

Dr. Naresh Rimal

Executive Chairperson

Jiwati Private Limited

सत्यं बृहदृतमुग्रं दीक्षा तपो ब्रह्म यज्ञः पृथिवीं धारयन्ति ।

सा नो भूतस्य भव्यस्य पत्न्युरुं लोकं पृथिवी नः कृणोतु ॥१॥

Salutations to Mother Earth, upheld by truth and cosmic law, and guided by sages.

May she enrich our lives and lead us toward the cosmic life.

Introduction

The ancient Sanskrit verse “यत् पिण्डे तत् ब्रह्माण्डे” - "As is the body, so is the universe"-and the above Vedic hymn Bhūmīsūktam highlight the deep connection between humans and the natural world. These contexts honor Mother Earth, who is upheld by the principles of Satyam (Truth) and Ritam (Cosmic Order). They remind us that Earth, in her purity and balance, supports all life and carries both the past and the future within her. As climate change and environmental degradation threaten this balance, these ancient teachings offer a vital perspective. They encourage us to recognize our responsibility toward nature and to align our actions with the rhythms of the Earth. By drawing wisdom from these traditions, we can work toward restoring harmony and sustainability in our relationship with the planet.

This chapter examines the complex interplay between rising temperatures, climate change, and development, offering critical insights and strategic approaches to address these pressing challenges. As global temperatures escalate due to climate change, the intensifying heat not only impacts development but is also shaped by it, creating a dynamic feedback loop. This chapter explores these intersections, highlighting the multifaceted consequences of heat and the adaptive and mitigative strategies necessary to navigate them. A nuanced understanding of these dynamics is essential for formulating effective policies and development frameworks that enhance resilience and sustainability (IPCC, 2022). Figure 1 shows the intricate challenge of analyzing the drivers and impacts of global warming, alongside the development of robust mitigation strategies, demands a multidisciplinary approach (Holme & Rocha, 2023).

The science of heat and climate change

Heat and climate change are interconnected through the way the sun warms

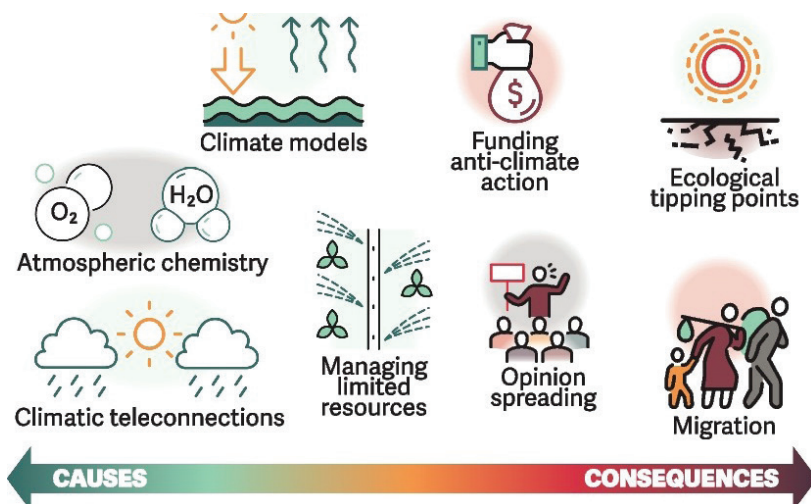


Figure 1. Topic related to climate change (Source: Holme and Rocha 2023)

the Earth. Normally, greenhouse gases in our atmosphere trap some of this heat, maintaining temperatures suitable for life. However, human activities like burning fossil fuels and deforestation increase these gases, trapping more heat than usual. This extra heat is causing the Earth’s temperature to rise, leading to more extreme weather, melting ice caps, and rising sea levels. For instance, glaciers in the Himalayas are melting rapidly, affecting water supplies for millions of people downstream (Bookhagen & Burbank, 2010). In regions like Nepal, changing temperatures are causing unpredictable rainfalls, leading to crop failures (Poudel et al., 2023). Understanding these links is vital for finding ways to address and adapt to climate change.

Greenhouse gas emission

Human activities significantly boost greenhouse gas concentrations, driving global warming and climate change. Fossil fuel combustion for energy and transportation releases carbon dioxide (CO₂), a major greenhouse gas (Stocker et al., 2014). Industrial processes emit nitrous oxide (N₂O) and methane (CH₄), with agriculture contributing through livestock emissions and rice paddies (Smith et al., 2014). These emissions enhance the greenhouse effect, leading to rising global temperatures and climate changes. For Nepal, the regional context adds further complexity. Neighboring countries like China and India, both industrially “advanced”, contribute to regional pollution and climate change, placing additional stress on small nations like Nepal nestled in the Himalayas. Industrial emissions from these neighboring countries exacerbate air pollution and climate impacts in Nepal, affecting its environment and public health (Bhattacharya, 2010). Nepal's development trajectory also poses environmental challenges. Rapid urbanization, deforestation for infrastructure development, and increased fossil fuel use contribute to

greenhouse gas emissions and environmental degradation within the country. This local impact, combined with regional and global pressures, exacerbates climate change effects in Nepal, making it particularly vulnerable to rising temperatures and extreme weather events. The melting of polar ice and increased water vapor in the atmosphere exacerbate global warming through feedback mechanisms. Melting ice uncovers darker surfaces, which absorb more sunlight rather than reflecting it, increasing warming and accelerating ice melt (IPCC, 2021). Higher temperatures increase evaporation, adding more water vapor—a potent greenhouse gas—to the atmosphere, further amplifying the greenhouse effect.

Chaotic urbanization

In rapidly growing cities like Kathmandu and other cities in Nepal, the Urban Heat Island (UHI) effect is significant due to extensive concrete use and urban expansion. This phenomenon causes urban areas to be considerably warmer than rural surroundings. Concrete and asphalt absorb and slowly release heat, raising city temperatures and increasing health risks like heatstroke and respiratory problems (Arnfield, 2003). The rising demand for cooling systems strains energy infrastructure, leading to higher costs and frequent outages (Gartland, 2010) Addressing UHI effects involves strategies such as improved urban planning, incorporating green spaces, and using reflective building materials (Gill, 2017; Gill et al., 2010). Green roofs and urban forestry can provide cooling through shading and transpiration (Nowak & Dwyer, 2007).

Historical and projected temperature trends

Historical data demonstrate a consistent rise in global temperatures over the past century, driven largely by fossil fuel burning and deforestation (Hansen et al., 2017; Hansen & Sato, 2016) illustrated by Figure 2. Climate models predict continued warming, with increased frequency and intensity of heat waves.

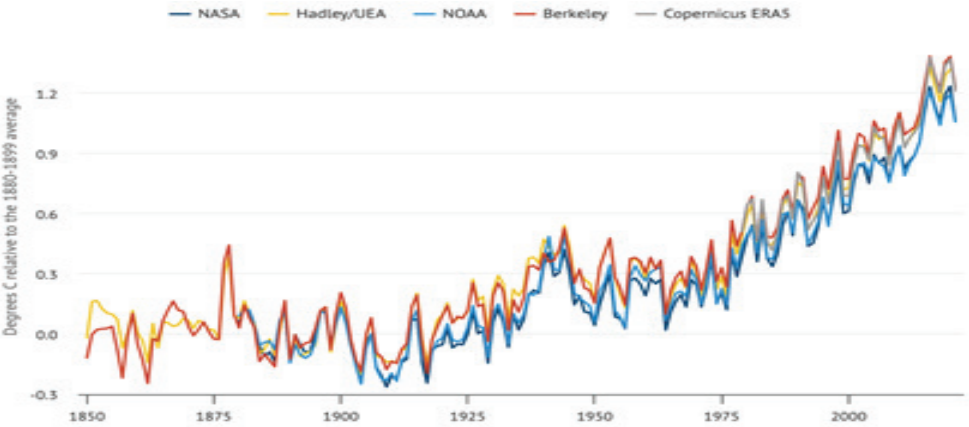


Figure 2. Global surface temperature 1850-2021 (Source: Carbonbrief.com)

These projections suggest that, regardless of emission scenarios, global temperatures will rise, affecting ecosystems and human health (IPCC, 2021). Heatwaves are projected to become more common and severe, impacting biodiversity and human health. For instance, the 2003 European heatwave resulted in approximately 70,000 excess deaths (Robine et al., 2008). Infrastructure also get affected, with rising temperatures causing damage to roads and buildings and increasing energy demand (Ebi et al., 2011).

Health impacts of surging heat

The health impacts of surging heat are increasingly evident as temperatures rise (Figure 3). Heatwaves exacerbate health risks, including heat exhaustion,

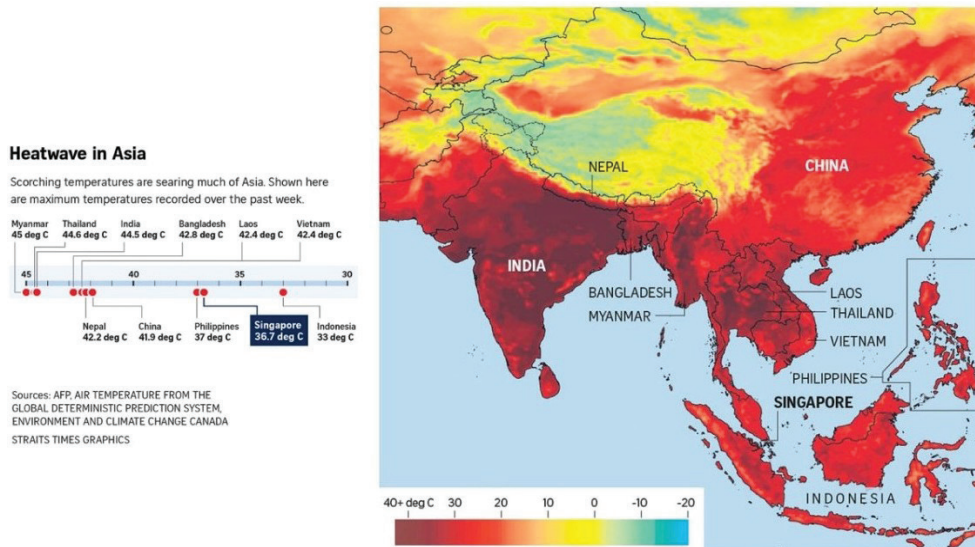


Figure 3. Heatwave in Asia: Temperature across Asia (in °C) on July 19th, 2023 Source AFP, Air temperature from the Global Deterministic Prediction System, Environment and Climate Change Canada, Straits Times.

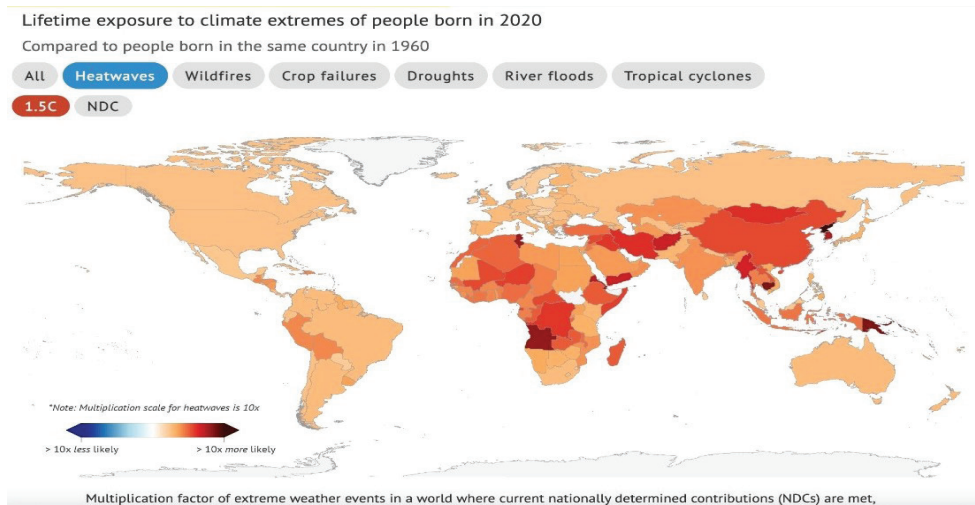


Figure 4. Image show that heatwaves dominate the increasing exposure to hazard (Source: Carbonbrief.org). The orange and red shading indicates that newborns in 2020 will have greater exposure to climate extremes.

heatstroke, and chronic conditions such as cardiovascular and respiratory diseases. Vulnerable populations, including the elderly, children, and those with pre-existing conditions, are particularly at risk (Lindsay et al., 2023). The strain on healthcare systems due to increased demand for medical care and cooling services highlights the broader societal implications of rising temperatures (Koppe et al., 2004). These implications are resulted into Wildfires, crops failures, droughts, river floods and more (Figure 4).

Direct health effects

Prolonged exposure to high temperatures can lead to heat-related illnesses, such as heat exhaustion and heatstroke. Heat exhaustion, caused by excessive sweating and dehydration, can lead to symptoms like weakness, dizziness, and fainting (Al Mahri & Bouchama, 2018). Heatstroke, characterized by a core body temperature above 40°C (104°F), is a medical emergency that can cause organ damage and death if untreated (Yeo, 2004). Dehydration, which impairs bodily functions, is exacerbated by high humidity (Cian et al., 2000). Vulnerable groups include the elderly, who face age-related declines in temperature regulation, and children, who are less efficient at managing temperature (Basu & Ostro, 2008). Individuals with pre-existing conditions, such as cardiovascular diseases, also face higher risks (Levy & Patz, 2015). The increased demand for healthcare systems during heat waves can strain resources and lead to higher costs (Koppe et al., 2004).

Heat-related illnesses

Heat-related illnesses, such as heat exhaustion and heatstroke, result from prolonged exposure to high temperatures. Heat exhaustion occurs when the body loses excessive fluids and salts, leading to symptoms like dizziness and nausea. Heatstroke, a more severe condition, involves a dangerous rise in core body temperature and can cause neurological damage (Bouchama & Knochel, 2002). Dehydration, a critical consequence of heat exposure, impairs bodily functions and can lead to severe complications (Ebi et al., 2006).

Indirect health effects

Indirect health effects include mental health impacts and the spread of vector-borne diseases. Persistent heat can exacerbate mental health issues by increasing stress, and anxiety, and disrupting sleep patterns (Haines et al., 2006). Extreme heat can also impact sleep quality, worsening conditions like depression and anxiety (Irwin, 2023; Stone et al., 2022). Vector-borne diseases, such as malaria and dengue fever, can spread more widely as warmer temperatures expand the habitats of disease-carrying vectors (Reis & Guzman, 2023; Tahir et al., 2023). Malaria, transmitted by *Anopheles* mosquitoes, and dengue fever, transmitted by *Aedes* mosquitoes, are both

influenced by temperature increases (Randolph & Rogers, 2010; Rogers et al., 2001). The indirect health effects of climate change and extreme heat are significant. Addressing mental health impacts and managing vector-borne diseases require comprehensive approaches, including mental health support, enhanced disease control measures, and public health interventions to mitigate the broader impacts of a changing climate (C. Mora et al., 2022; Myers & Patz, 2009; Ryan et al., 2019).

Vulnerable populations

In Nepal, the phenomenon of poor ribbon-like urbanization exacerbates the challenges posed by extreme heat, particularly for marginalized and disadvantaged communities. Ribbon-like urbanization refers to the haphazard and often unplanned expansion of cities, where development stretches out in narrow, elongated strips along major roads or corridors without cohesive planning or infrastructure support (Anees et al., 2022). In cities like Kathmandu and other growing urban areas, ribbon-like urbanization has led to a proliferation of informal settlements and densely populated areas with inadequate planning and infrastructure. These areas often lack essential amenities such as proper drainage systems, green spaces, and efficient waste management, which are crucial for mitigating the effects of extreme heat (S. Bhandari & Zhang, 2022). For many residents in these poorly planned urban zones, the quality of housing is substandard, with makeshift or poorly constructed homes that do not offer sufficient protection from heat. These dwellings are frequently built from materials that do not insulate against high temperatures or provide adequate ventilation, further intensifying the impacts of heat waves (Magar et al., 2021).

The ribbon-like urbanization also strains existing infrastructure and public services. Roads and public transportation systems become congested, and the expanded areas often lack sufficient access to healthcare facilities and emergency services. This limited access means that residents in these areas may struggle to get the medical care and support they need during heat waves (Bhandari & Shrestha, 2020). Furthermore, the lack of green spaces and urban planning in these ribbon-like developments exacerbates the urban heat island effect. This phenomenon occurs when built-up areas become significantly warmer than their rural surroundings due to human activities and the concentration of heat-absorbing materials like concrete and asphalt (Oke, 1982). In these areas, the absence of vegetation and trees means there is less natural cooling and less shade, which contributes to higher temperatures and increased heat stress for residents (Akbari, 2009; Ghaffarianhoseini et al., 2015).

Addressing the challenges of poor ribbon-like urbanization requires comprehensive urban planning and development strategies that prioritize climate resilience. Initiatives such as improving housing quality, expanding

green spaces, and enhancing infrastructure and access to services can help mitigate the adverse effects of extreme heat. Engaging with local communities in planning processes and implementing adaptive measures tailored to their specific needs is also crucial for effectively managing the impacts of extreme heat in these rapidly urbanizing areas (Bhandari, 2024).

Nepal wildfires and heatwave

Nepal is increasingly facing widespread and intense wildfires during heatwaves, as evidenced by the notable fire incidents of 2024. These wildfires have become a major environmental and public health concern across the country. Unprecedentedly high temperatures, prolonged dry spells, and strong winds created ideal conditions for the rapid spread of wildfires, affecting forests, biodiversity, and air quality (ICIMOD, 2025; Phys.org, 2024). Nepal has experienced an increase in both the frequency and extent of forest fires, yet very little is known about their spatiotemporal dimensions (Mishra et al., 2023). The blazes not only devastated critical ecosystems, including national parks and community forests, but also led to severe haze and pollution, significantly impacting public health, particularly in urban areas like Kathmandu (Bolakhe, 2024; Kuikel et al., 2024).

The 2021 and 2024 wildfires underscored Nepal’s vulnerability to climate-

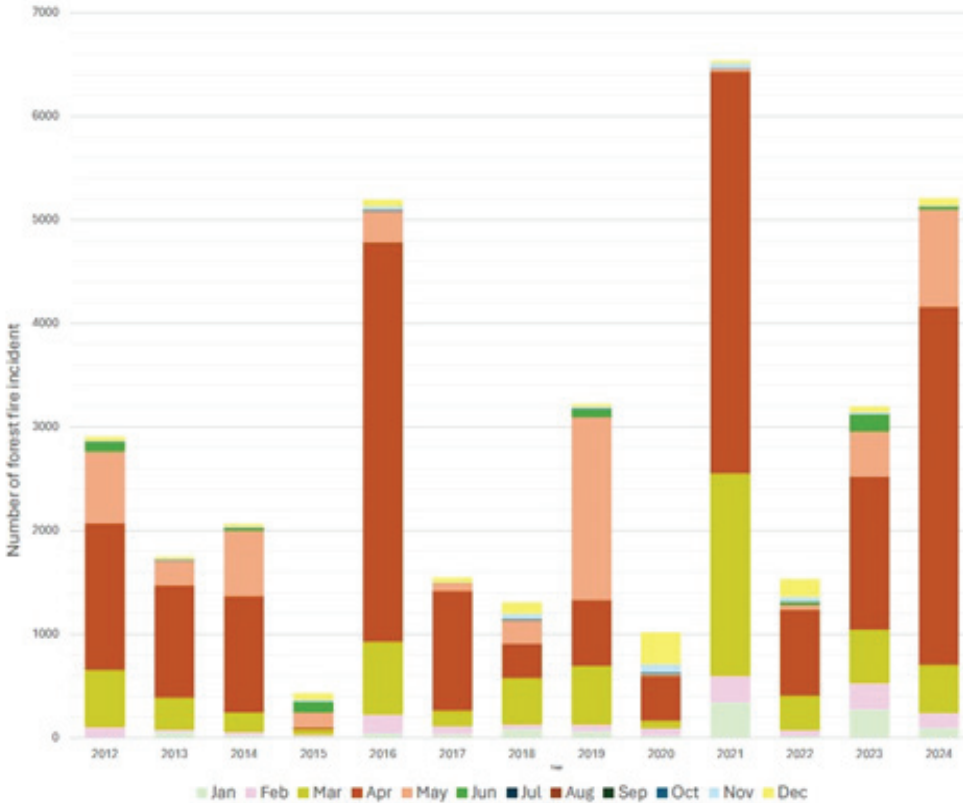


Figure 5. Increasing fire incidences across Nepal
 Source: blog.icimod.org/cryosphere-water-risks/forest-fires-in-nepal-the-unseen-threat-of-droughts

induced disasters, revealing gaps in wildfire management, early warning systems, and disaster preparedness (Pokharel et al., 2023). The fires also posed significant challenges for firefighting efforts, as many occurred in remote and difficult-to-access regions. Furthermore, the increased frequency and intensity of wildfires raised concerns about long-term ecological damage, soil degradation, and the loss of carbon sinks, further complicating Nepal's climate adaptation strategies (Dahal et al., 2025). The crisis highlighted the urgent need for strengthened fire management policies, investment in early detection and response mechanisms, and enhanced community engagement in forest conservation.

As climate change accelerates, Nepal faces mounting challenges in mitigating and adapting to extreme weather events, necessitating a multi-sectoral approach to resilience-building and environmental governance (Nature, 2024; ICIMOD, 2024). Heatwaves and wildfires are interlinked climate challenges in Nepal that require urgent attention (Niggli et al., 2022). Addressing them demands integrated policies focused on climate change adaptation, disaster preparedness, and sustainable land and forest management practices to reduce vulnerability and enhance resilience.

Socioeconomic status

Socioeconomic status is a major determinant of vulnerability to heat-related health issues. Individuals with lower incomes may have less access to resources that can mitigate the effects of extreme heat, such as air conditioning or cooling centers (Harlan et al., 2006, 2014). Economic constraints can also limit their ability to make necessary home improvements, like installing insulation or upgrading windows to reduce indoor temperatures (Wilhelmi & Hayden, 2010). Lower-income communities often reside in areas with less green space and more concrete, which exacerbates the urban heat island



Figure 6. Fast Urbanizing Kathmandu City

Source: Asif Ishtiaque Milan Shrestha and Netra Chhetri in mdpi.com/2076-3298/4/4/72#

effect and increases local temperatures (Knowles, 2020). Additionally, those with lower socioeconomic status might be employed in outdoor or physically

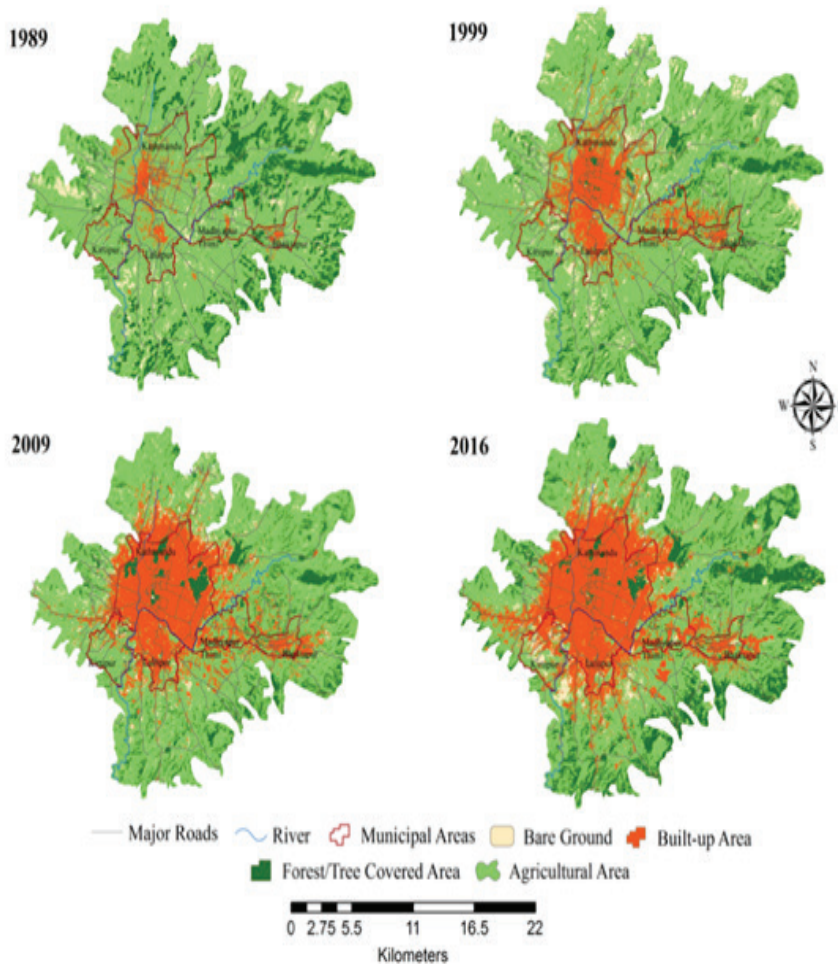


Figure 7. Fast Urbanizing Kathmandu City

Source: Asif Ishtiaque Milan Shrestha and Netra Chhetri in [mdpi.com/2076-3298/4/4/72#](https://doi.org/10.1002/mqpi.201700072)

demanding jobs, increasing their exposure to extreme heat and its associated health risks (Kjellstrom et al., 2018). Economic hardship can also result in limited access to healthcare services, making it more difficult for individuals to receive timely medical care for heat-related illnesses (Gronlund et al., 2019; Sorensen & Hess, 2022).

Housing quality

Housing quality plays a critical role in how individuals experience and cope with heat. Poor-quality housing, often found in marginalized communities, may lack adequate insulation, ventilation, and cooling systems. This can result in higher indoor temperatures during heatwaves, which can exacerbate health issues for residents (Harlan et al., 2006). In densely populated areas

with inadequate housing infrastructure, heat can be particularly intense due to the accumulation of heat in concrete and asphalt, further increasing the risk of heat-related health problems (Harlan et al., 2006). Housing without proper cooling systems or access to cooling centers makes it more challenging for residents to stay safe during extreme heat events (Wilhelmi & Hayden, 2010).

Access to healthcare

Access to healthcare is another crucial factor influencing vulnerability to heat-related health issues. Individuals without regular access to healthcare services may not receive timely treatment for heat-related conditions such as heat exhaustion or heatstroke (Basu & Samet, 2002). This lack of access can be exacerbated by economic barriers, transportation challenges, or a lack of healthcare facilities in underserved areas (Gronlund et al., 2019). In marginalized communities, there may also be a higher prevalence of chronic health conditions, such as cardiovascular or respiratory diseases, that can be worsened by extreme heat (Basu & Samet, 2002). Without adequate medical support, individuals with pre-existing conditions are at greater risk of severe health complications during heat waves (Basu & Samet, 2002).

Additional factors

Several other factors contribute to vulnerability during heatwaves. These include:

Group	Description	Reference
Age	Elderly and young children are more vulnerable to heat-related health issues due to reduced physiological resilience.	(Margolis, 2021) (Zheng et al., 2021)
Disability	People with disabilities may struggle more with extreme heat, especially if dependent on sensitive assistive devices.	(Chakraborty, 2024) (Raju et al., 2014)
Immigrant Status	Immigrants and refugees may face greater risks during heat waves due to barriers like language and limited resources.	(Horton et al., 2021) (Doherty et al., 2024)

The impact of extreme heat is unevenly distributed, with marginalized communities often facing the greatest risks. Socioeconomic status, housing quality, and access to health care are significant factors that influence vulnerability to heat-related health issues. Addressing these disparities requires targeted interventions, including improving access to cooling resources, enhancing healthcare services, and investing in infrastructure improvements to better protect vulnerable populations during extreme heat events (Harlan et al., 2006; Gronlund et al., 2019).

Infrastructure and urban development

Understanding the interplay between infrastructure, urban development, and extreme heat is crucial for determining how cities can manage or worsen heat-related challenges. As urban areas expand, the design and quality of infrastructure significantly impact local temperatures, heat management, and public health. Addressing these aspects is vital for building resilient cities that can handle rising temperatures due to climate change. Global infrastructure investment stands at USD 4.5 trillion annually, but there is a shortfall of USD 2.5 trillion each year (Global Infrastructure Hub, 2023). In South Asia, infrastructure investment ranges from 8 percent to 12 percent of GDP (ADB, 2017), while Nepal alone requires over USD 1 billion annually to maintain adequate infrastructure (WB, 2019). The widespread use of concrete in urban areas contributes significantly to overheating and the heat island effect, as these surfaces absorb heat rapidly and lose it quickly at night (USEPA, 2025).

Urban heat island effect

The Urban Heat Island (UHI) effect occurs when urban areas experience significantly higher temperatures than their rural surroundings due to human activities and built environments. Several factors contribute to this phenomenon. One major factor is the reduction in vegetation; as cities expand, natural landscapes like forests and grasslands are replaced with buildings and roads, leading to a loss of cooling provided by trees and plants (Oke, 1995; Venhari et al., 2017). This results in less shade and higher surface temperatures. Another contributing factor is the prevalence of heat-absorbing materials such as asphalt, concrete, and metal in urban areas. These materials absorb and retain heat from the sun during the day and release it slowly at night, leading to elevated nighttime temperatures (Sailor et al., 2015). Additionally, energy emissions from air conditioning, heating systems, and transportation contribute to the warming. Vehicles emit heat and exhaust gases, and the extensive use of air conditioning releases waste heat into the environment (Akbari et al., 2001). Industrial and commercial activities also add to the heat load through their operations and energy use (Gartland, 2008). The albedo effect, where urban surfaces have low reflectivity and absorb more solar radiation, further exacerbates the UHI effect (Voogt & Oke, 2003). The consequences of the UHI effect include increased energy consumption, deterioration of air quality, and adverse health impacts such as heat-related illnesses, particularly affecting vulnerable populations (Santamouris, 2020). It can also alter local weather patterns, influencing regional climate and weather systems (Liu et al., 2020). Addressing the UHI effect involves strategies such as increasing green spaces, using reflective or cool roofing materials, and promoting energy-efficient technologies to enhance urban resilience and improve the quality of life in cities (Pisello, 2017).

Impacts on infrastructure

In Nepal, infrastructure is significantly affected by the lack of proper drainage, maintenance, and adherence to construction standards, which exacerbates the impact of urbanization and extreme weather conditions (Timsina et al., 2020). Many urban areas, including Kathmandu, suffer from inadequately designed or insufficient drainage systems, leading to frequent flooding and waterlogging (Bhattarai et al., 2021). This has been vividly felt by the communities in Nepal during the monsoon of July-August 2024. These issues not only damage roads and buildings but also weaken infrastructure, increasing the risk of structural failures. Additionally, routine maintenance is often neglected due to limited resources and administrative inefficiencies, causing roads and buildings to deteriorate rapidly (Ruiz & Guevara, 2020). Without regular upkeep, infrastructure becomes more susceptible to damage from extreme heat and heavy rains, resulting in higher repair costs and disruptions to daily life (Maharjan et al., 2023). Moreover, construction practices in Nepal frequently fall short of modern standards, with many buildings and roads being constructed without adequate adherence to engineering codes and environmental guidelines. This lack of compliance leads to poor-quality construction that is ill-equipped to handle environmental stresses, further aggravating the Urban Heat Island (UHI) effect and contributing to infrastructure degradation (Bello-Osagie et al., 2021). The interplay of these factors creates a vicious cycle where deteriorating infrastructure becomes increasingly vulnerable to future environmental challenges, requiring ever more costly repairs and upgrades. Addressing these issues demands improved infrastructure planning, stricter enforcement of building standards, and a commitment to regular maintenance to enhance resilience and break the cycle of degradation.

Energy systems

Higher temperatures significantly impact energy systems by increasing the demand for cooling, which places considerable strain on energy grids and drives up costs (Russell–Bennett et al., 2020). As heatwaves become more common, the use of air conditioning and other cooling systems surges, leading to a marked rise in electricity consumption (Davis & Hanna, 2020). This increased demand stresses energy infrastructure, often pushing power grids to their limits and potentially causing power outages or requiring emergency measures to stabilize the supply (Raissi & Reames, 2020). Consequently, utility bills for consumers soar, and energy providers face elevated operational costs (Sturm, 2020b, 2020a). Additionally, extreme heat can reduce the efficiency of power generation systems, as high temperatures negatively affect equipment performance and increase the likelihood of operational issues (Zhang et al., 2021). Prolonged exposure to high temperatures can

also accelerate the degradation of critical infrastructure components such as transformers, power lines, and substations, reducing their lifespan and increasing the need for maintenance and replacement). Overall, the combined effects of higher demand, reduced efficiency, and accelerated wear and tear on infrastructure highlight the need for improved energy efficiency, enhanced grid resilience, and alternative cooling solutions to mitigate the impacts of rising temperatures on energy systems (Z. Li et al., 2020; Yalew et al., 2020)

Transportation and construction

Extreme heat can have a profound impact on transportation and construction infrastructure, leading to significant maintenance challenges and safety concerns (Salimi & Al-Ghamdi, 2020). For transportation infrastructure, high temperatures can cause asphalt roads to soften, resulting in deformation such as rutting and increased wear and tear (Jyothirmai et al., 2020). This deformation not only impairs driving conditions but also necessitates frequent repairs to address cracks and potholes exacerbated by the heat (Hafezzadeh et al., 2021). Railways are similarly affected, with metal tracks expanding and potentially buckling under high temperatures, which can lead to derailments and operational disruptions (Kljaić et al., 2023). Maintaining rail infrastructure becomes more resource-intensive as operators must implement additional safety measures and conduct more frequent inspections (G. Sharma & Rai, 2023)

In construction, extreme heat affects building integrity by causing materials like concrete and steel to expand and contract. This thermal stress can lead to structural issues such as cracking and warping, compromising the stability and durability of buildings (Athauda et al., 2023; Grottesi et al., 2023). Additionally, roofing materials and insulation can degrade more quickly under high temperatures, increasing cooling demands and energy costs (Pavlović et al., 2021). The quality of construction materials can also suffer, with concrete prone to thermal cracking and roofing materials deteriorating faster (Y. Li et al., 2024). The cumulative effect of these issues results in a greater need for frequent repairs and replacements, straining maintenance budgets and resources. Moreover, extreme heat introduces safety risks for infrastructure users and construction workers, with degraded roads increasing accident risks and potentially hazardous conditions for rail passengers (Dodman et al., 2022; Hamim, 2020). For construction workers, the heat poses health risks, such as heat-related illnesses (Venugopal et al., 2021). Addressing these challenges requires enhanced maintenance strategies, investment in heat-resistant materials, and adaptations in construction practices to improve resilience and ensure safety amid rising temperatures (Huang & Li, 2023)

Adaptive strategies

Adaptive strategies such as green infrastructure and sustainable building practices are vital for addressing the Urban Heat Island (UHI) effect and reducing energy consumption. Green infrastructure can significantly mitigate the UHI effect by increasing urban green spaces like parks and tree-lined streets, which absorb and dissipate heat, thus lowering overall city temperatures (Pereira et al., 2024). The installation of green roofs—roofs covered with vegetation—not only helps to insulate buildings and reduce rooftop temperatures but also manages stormwater by absorbing rainwater (Barriuso & Urbano, 2021). Additionally, using reflective materials for roofing and pavement can minimize heat absorption, helping to cool urban environments and decrease the UHI effect (Cheela et al., 2021; Santamouris & Yun, 2020). These green infrastructure measures not only combat heat but also enhance air quality, support biodiversity, and provide valuable recreational spaces (Farrell et al., 2022). Sustainable building practices complement these efforts by focusing on energy efficiency and improved building performance. Designing buildings with enhanced insulation helps maintain more stable indoor temperatures, reducing the need for excessive air conditioning and lowering energy consumption (Chen et al., 2020; B. Li et al., 2020). Incorporating natural ventilation systems allows buildings to cool passively through strategic airflow, which decreases reliance on mechanical cooling systems (Gomis et al., 2021). Additionally, integrating energy-efficient technologies, such as high-efficiency HVAC systems, LED lighting, and renewable energy sources like solar panels, further reduces energy demands and operational costs (Ghamari & Sundaram, 2024). These practices not only help to mitigate the impacts of extreme heat but also contribute to long-term energy savings and a lower environmental footprint, supporting a more sustainable urban future (Mohammadpourlima et al., 2024).

Agricultural and water resource implications

High temperatures have significant implications for agriculture and water resource management. Heat stress from elevated temperatures impairs plant growth and can lead to reduced crop yields (Ullah et al., 2022). Heat stress affects the photosynthesis process, which is crucial for plant development, and increases the water demand of crops, potentially leading to water shortages (Dos Santos et al., 2022). This combination of factors can severely impact food security by diminishing the quantity and quality of agricultural produce (Mbow et al., 2020). Additionally, regional variations play a crucial role in how different crops and areas respond to heat. Some crops and regions are more sensitive to high temperatures than others, necessitating tailored adaptation strategies to address the specific needs and vulnerabilities of each region and crop type (Pechan et al., 2023).

In terms of water resource management, rising temperatures contribute to increased evaporation rates, which reduces the availability of water for irrigation and drinking purposes (Solaimani et al., 2021). The higher rates of evaporation can deplete water sources more rapidly, making it more challenging to manage water resources effectively (R. K. Mishra, 2023). This exacerbates the strain on already limited water supplies, affecting both agricultural productivity and the availability of water for human consumption and other uses. Addressing these challenges requires implementing adaptive measures to optimize water use and enhance agricultural resilience in the face of rising temperatures.

Efficient use

To manage the reduced water resources resulting from increased evaporation and higher temperatures, implementing efficient irrigation techniques and promoting water conservation are essential strategies. Efficient irrigation methods, such as drip irrigation, deliver water directly to the plant roots, minimizing loss through evaporation and runoff and ensuring precise water application (Baruah et al., 2024). Modern sprinkler systems with precision control, including soil moisture sensors and weather-based controllers, adjust watering schedules based on real-time conditions, optimizing water use and reducing waste (Ahmed et al., 2023). Additionally, soil moisture management techniques, such as monitoring and using moisture-retentive soil amendments, help prevent over-irrigation and enhance the soil's water-holding capacity (Field et al., 2020). Rainwater harvesting also provides an alternative water source by capturing and storing rainwater for irrigation, reducing reliance on conventional supplies (Raimondi et al., 2023; Richards et al., 2021).

Promoting water conservation involves educating farmers and the public about efficient water use and the benefits of adopting water-saving techniques (Alam et al., 2021). Policy measures and incentives, such as subsidies for water-efficient equipment and grants for conservation projects, encourage the implementation of these practices (Thomson, 2020). Additionally, adopting water-saving technologies like low-flow fixtures and appliances further supports conservation efforts (Adeyeye et al., 2020). Integrated Water Resource Management (IWRM) provides a holistic approach by coordinating water, land, and resource management to maximize benefits while ensuring environmental sustainability (Bilalova et al., 2023). By integrating these strategies, it is possible to effectively manage reduced water resources, sustain agricultural productivity, and address the challenges posed by rising temperatures and increased evaporation (Ahmed et al., 2023).

Adaptation measures

Adapting to rising temperatures and water scarcity involves implementing effective measures such as developing heat-resistant crops and advancing irrigation technologies (Grigorieva et al., 2023). Heat-resistant crops are bred or genetically modified to endure higher temperatures without significant damage to their growth or yield (Shahbaz, 2024). These crops often feature improved heat tolerance, enabling them to maintain essential physiological functions like photosynthesis and respiration even in extreme heat (Dos Santos et al., 2022). They may also have enhanced water efficiency, with deeper root systems or mechanisms that minimize water loss, and can exhibit reduced flower drop and fruit set issues under heat stress (Bijalwan et al., 2022). Additionally, some varieties are designed with faster growth cycles to avoid the worst heat periods, allowing for more stable yields and better food security despite challenging conditions (Sabagh et al., 2022).

Irrigation innovations are equally crucial for managing water resources efficiently. Drip irrigation systems deliver water directly to plant roots, minimizing evaporation and runoff while optimizing water use (Kisekka et al., 2017). Advanced soil moisture monitoring technology provides real-time data, enabling precise irrigation based on soil conditions and crop needs, which helps prevent over-irrigation and ensures that plants receive adequate moisture (Lakhier et al., 2024). Smart irrigation systems integrate weather forecasts and soil data to automate and adjust watering schedules, enhancing water efficiency and reducing waste (Khebbache et al., 2023). Precision irrigation techniques, such as variable rate irrigation, apply water more precisely to different field areas based on specific needs, further optimizing water use (Bwambale et al., 2022). Additionally, rainwater harvesting and storage capture and store rainwater for use during dry periods, supplementing irrigation and reducing reliance on conventional water sources (Seitzhan et al., 2023). Together, these adaptation measures enhance resilience in agriculture, ensuring sustainable productivity and effective water management in increasingly hot and arid conditions (Kang et al., 2017)

Economic impacts of surging heat

Extreme heat poses a considerable threat to productivity, particularly in sectors that rely heavily on outdoor labor, such as agriculture, construction, and manufacturing (De Lima et al., 2021; Moda et al., 2019). In Nepal, where the climate is increasingly affected by rising temperatures, these impacts are becoming increasingly evident (B. Paudel et al., 2020). In Nepali agriculture, high temperatures can significantly affect both the health of workers and crop yields. For instance, in the Terai region, which is the country's major agricultural area, extreme heat can lead to severe heat stress

among farmers (Pokhrel et al., 2019). This not only reduces the efficiency of labor but also affects crop production. High temperatures can cause heat stress in plants, reducing yields of staple crops like rice and maize (Sarkar et al., 2021). Furthermore, extreme heat can lead to increased evaporation rates, exacerbating water shortages and affecting irrigation practices (Hamal et al., 2021). Farmers face higher costs for water and may experience decreased crop quality and quantity, impacting food security and driving up prices (Jatav et al., 2024)

Similarly, in the construction sector, the effects of extreme heat in Nepal are particularly concerning. Construction workers in Nepal are often exposed to direct sunlight and high temperatures while working on building projects. This exposure can lead to heat-related illnesses such as heat stroke and dehydration, reducing workers' productivity and increasing the risk of accidents (Z. Khan et al., n.d.). For example, during the summer months, construction projects may experience delays due to the need for more frequent breaks and health-related work stoppages. These delays can increase project costs and extend timelines, affecting the overall efficiency of the construction sector (S. Dixit, 2020).

In Nepal's manufacturing sector, extreme heat also poses significant challenges. Many factories, particularly those in the textile industry, are located in areas with inadequate cooling systems. High temperatures can lead to machinery malfunctions and reduced efficiency, impacting production rates (Mayr et al., 2012). Workers in these factories may struggle with uncomfortable conditions, which can decrease their productivity and job satisfaction (Raziq & Maulabakhsh, 2015). For example, the textile industry, a significant part of Nepal's economy, faces the dual challenge of maintaining machinery in high heat and ensuring worker productivity, which can lead to increased operational costs and reduced competitiveness (Ghimire et al., 2020).

The economic implications of reduced productivity due to extreme heat are far-reaching. In Nepal, when key sectors such as agriculture, construction, and manufacturing experience declines in productivity, the broader economy is affected (Bhatta et al., 2019). For instance, reduced agricultural output can lead to higher food prices, impacting the cost of living for many Nepali (Bandara & Cai, 2014; Chalise et al., 2017). In the construction industry, delays and increased costs can affect housing and infrastructure development, which are crucial for the country's growth (Koirala & Shahi, 2024; Timilsina et al., 2021). Similarly, manufacturing slowdowns can reduce exports and impact employment in this sector (D. Karki et al., 2024) The cumulative effect of these productivity losses is a potential slowdown in economic growth. Nepal's economy, which relies significantly on agriculture and

labor-intensive industries, can experience diminished economic stability and growth as a result of these challenges. Businesses may face higher operational costs and reduced profit margins, potentially leading to job cuts or reduced working hours.

Addressing the impacts of extreme heat requires immediate measures to protect workers, such as implementing cooling breaks and providing adequate hydration. Long-term strategies might include investing in more resilient infrastructure and improving water management practices to adapt to changing climatic conditions (Dhyani et al., 2020; Karki et al., 2022). By taking these steps, Nepal can better mitigate the negative effects of extreme heat on productivity and overall economic performance.

Insurance costs and infrastructure repair

The increased frequency of heat waves and the associated damages are significantly impacting insurance costs and infrastructure maintenance in Nepal. As temperatures rise and heatwaves become more common, both the insurance industry and infrastructure management face escalating challenges that translate into higher costs for individuals and the government alike (Mills & Lecomte, 2005).

In Nepal, heatwaves have become more frequent and intense, particularly affecting infrastructure in urban and rural areas. For example, in Kathmandu and other major cities, prolonged periods of extreme heat have led to accelerated wear and tear on roads and buildings. High temperatures cause asphalt on roads to soften and become more susceptible to damage from traffic, while heat can also lead to the expansion and cracking of concrete structures (Engelbrecht & Paige-Green, 2018; Wojtowicz & Papadouris, 2023). The cost of maintaining and repairing these infrastructures has risen as a result. Roads that might previously have required periodic maintenance now need more frequent and extensive repairs, straining municipal budgets and increasing the financial burden on local governments (Poudel et al., 2024; Sharma, 2020).

The impact of extreme heat on infrastructure also extends to the water supply systems. In regions like the Terai, where heat exacerbates evaporation rates, there are increased costs associated with maintaining and upgrading water storage and distribution systems (Khadka et al., 2024). The strain on these systems, combined with the need for more frequent repairs due to heat-induced damage, leads to higher operational and repair expenses. This increased financial pressure can divert resources from other critical areas and affect overall infrastructure development and maintenance (Raut, 2020).

Insurance costs in Nepal are similarly affected by the rise in heat waves and their associated damages. As the frequency and severity of heat-

related incidents increase, insurance companies face a higher volume of claims related to infrastructure damage, property loss, and health issues (Mannappan, 2016; Swami & Parthasarathy, 2022). For instance, residential and commercial property insurance claims can rise due to damages from heatwaves, such as roof damage or malfunctioning air conditioning systems. The increased number of claims results in higher premiums for policyholders, reflecting the elevated risk that insurers must cover. In the agricultural sector, insurance costs are also impacted. Farmers facing heat-induced crop failures or livestock losses may file more claims with agricultural insurance providers (Amare et al., 2019). The increased risk associated with climate change can lead insurers to raise premiums for farmers, making it more expensive for them to secure coverage against heat-related losses. This, in turn, affects the overall affordability of insurance for rural communities that are already vulnerable to climate impacts (Acharya et al., 2024; Karki et al., 2021).

The broader economic implications of these rising costs are significant. Higher insurance premiums can strain household budgets and reduce disposable income, impacting overall economic stability. Additionally, increased infrastructure repair costs can lead to budget reallocations, potentially diverting funds from other essential services such as education or health care. For businesses, the higher costs associated with maintaining and insuring property and infrastructure can reduce profit margins and affect competitiveness. To address these challenges, Nepal needs to adopt a proactive approach to infrastructure management and insurance planning. Investing in heat-resistant materials and technologies for infrastructure can reduce the long-term costs associated with repairs and maintenance. Additionally, incorporating climate resilience into urban planning and development can help mitigate the impact of extreme heat on infrastructure (Pantha et al., 2024; S. Poudel et al., 2023).

For the insurance sector, developing new models that account for the increasing risks associated with climate change can help manage rising premiums and claims more effectively. Governments and insurers might also explore subsidizing insurance for vulnerable sectors to ensure that coverage remains affordable despite rising costs. The increasing frequency of heatwaves in Nepal is driving up insurance premiums and repair costs for infrastructure. The resulting financial pressures affect both individual policyholders and government budgets, highlighting the need for strategic planning and investment in climate-resilient infrastructure and insurance solutions. Addressing these issues proactively can help mitigate the economic impacts and ensure more sustainable management of resources in the face of a changing climate.

Economic adaptation strategies

Investing in energy-efficient technologies and renewable energy sources is essential for reducing overall energy demand and associated costs. These advancements can significantly lower utility bills and decrease environmental impact by minimizing energy consumption and lowering greenhouse gas emissions (Gayen et al., 2024; Hassan et al., 2024). For instance, upgrading to energy-efficient appliances, such as LED lighting and high-efficiency heating and cooling systems, can lead to substantial long-term savings. Similarly, transitioning to renewable energy sources like solar, wind, and hydropower reduces dependence on fossil fuels and contributes to a cleaner energy grid.

However, the process of replacing old technologies with newer ones presents its own set of challenges. The production and deployment of new technologies often require substantial resources and energy. Manufacturing modern energy-efficient appliances and renewable energy systems involves raw material extraction, energy-intensive production, and transportation, all of which have environmental impacts. This creates a temporary increase in resource use and emissions, which the environment needs to assimilate before the benefits of the new technologies outweigh these initial costs. In Nepal, efforts to promote energy-efficient technologies such as induction stoves in rural areas have highlighted these challenges. While induction stoves offer significant energy savings and efficiency improvements over traditional cooking methods, their introduction in rural Nepal has faced numerous obstacles. One major issue is the need for a deeper understanding of local needs and demand. Induction stoves require a consistent and reliable electricity supply, which is often lacking in remote rural areas of Nepal (Paudel et al., 2023). The limited reach of the electricity grid and frequent power outages mean that many rural households cannot benefit from the energy efficiency of induction stoves. Moreover, the initial cost of purchasing and installing induction stoves can be prohibitive for many rural households. Despite the long-term savings on fuel and improved efficiency, the upfront investment required to (Shrestha et al., 2023). Additionally, the lack of local technical support and maintenance services for these new technologies can hinder their long-term usability and effectiveness. Many rural areas in Nepal lack the infrastructure to support the maintenance and repair of advanced appliances, leading to potential issues with the longevity and reliability of induction stoves.

The experience with promoting induction stoves in Nepal underscores the need for a more comprehensive approach to introducing new technologies in rural areas. A successful strategy must consider local energy infrastructure, financial constraints, and the availability of support services (A. Dixit, 2017).

For instance, integrating induction stoves with solar-powered systems or improving local electricity supply could make them more viable for rural communities. Additionally, providing financial assistance or subsidies to offset the initial costs, along with training programs to ensure proper maintenance, could help address some of the barriers. The challenges also extend to the broader issue of battery life and technology lifecycle management. The adoption of renewable energy systems, such as solar panels paired with battery storage, requires careful consideration of battery longevity and disposal (Lutz, 2019). In rural areas where access to recycling facilities is limited, managing battery waste and ensuring the sustainability of renewable energy technologies become critical issues (Jain et al., 2022).

While investing in energy-efficient technologies and renewable energy sources is crucial for long-term sustainability and cost reduction, the challenges associated with their implementation in rural areas like those in Nepal must be addressed. The experience with induction stoves illustrates the need for tailored solutions that consider local energy conditions, economic constraints, and infrastructure capabilities. By adopting a holistic approach that includes improving energy infrastructure, offering financial support, and providing maintenance services, Nepal can better leverage the benefits of new technologies while mitigating their associated challenges.

Economic diversification

Economic diversification is a critical strategy for mitigating the impacts of heat on specific sectors and enhancing overall resilience. By broadening economic activities, countries and regions can reduce their vulnerability to climate-related shocks and stabilize their economies (C. T. Mora et al., 2022). In the context of Nepal, this approach is particularly relevant as the country faces increasing challenges due to extreme heat and climate variability. However, successful diversification requires a systemic understanding of the economy and strategic identification of leverage points. For instance, while investing in renewable energy is crucial for reducing reliance on fossil fuels, Nepal must carefully evaluate the potential consequences of over-relying on any single type of renewable resource. Hydropower is a significant component of Nepal's renewable energy strategy, given the country's abundant river systems. Yet, excessive emphasis on hydropower can lead to its own set of challenges. For example, while hydropower projects can reduce greenhouse gas emissions, they may also impact local ecosystems and communities, particularly if water resources become overexploited or if projects displace local populations. To avoid these pitfalls, a balanced and informed approach is necessary. This means assessing not only the potential benefits but also the possible negative impacts of over-reliance on any single sector or technology. For example, while hydropower is an effective way to generate renewable energy, Nepal

should consider diversifying its energy mix to include other sources such as solar and wind power. This approach can help ensure a more stable and resilient energy supply, even in the face of varying climatic conditions that might affect water availability for hydropower itself.

In addition to energy diversification, other areas also require careful assessment and re-evaluation. For instance, while tourism presents an opportunity for economic growth, it is essential to develop it in a sustainable manner that does not exacerbate environmental degradation or strain local resources (Neto, 2003). Similarly, expanding the manufacturing sector should be done with attention to environmental impacts and local resource availability (S. Sharma et al., 2023). Implementing economic diversification effectively involves collaboration between the government, private sector, and local communities. Policymakers need to create supportive frameworks and incentives for investment in diverse sectors while ensuring that environmental and social considerations are addressed (Dhakal et al., 2022). For example, providing grants or subsidies for businesses that invest in sustainable technologies or practices can promote diversification and resilience (DesJardine et al., 2019).

In summary, economic diversification is a vital strategy for reducing the impact of heat on specific sectors and enhancing overall economic resilience. In Nepal, this means expanding beyond agriculture into sectors like tourism, manufacturing, and renewable energy while carefully assessing the potential trade-offs and impacts of such expansions. By adopting a holistic and informed approach, Nepal can create a more robust and adaptable economy capable of withstanding the challenges posed by extreme heat and climate change.

Policy and governance

International agreements like the Paris Agreement are pivotal in the fight against climate change and its impacts. This accord embodies a collective commitment from nations to reduce greenhouse gas emissions and combat climate change (UNFCCC, 2024). Nepal, as a signatory to the Paris Agreement, has committed to reducing its carbon footprint and enhancing its resilience to climate impacts. The country faces significant vulnerabilities due to its geographical and climatic conditions, including frequent heatwaves that threaten agriculture, water resources, and public health (Dhimal et al., 2021; Sigdel et al., 2023). The global framework provided by the Paris Agreement helps Nepal align its climate policies with international standards and secure financial and technical support from developed countries.

For example, Nepal's participation in the Paris Agreement has facilitated access to climate finance mechanisms such as the Green Climate Fund (GCF) and the Adaptation Fund. These resources are crucial for implementing climate

adaptation and mitigation projects, including those aimed at improving infrastructure resilience, developing early warning systems for heatwaves, and promoting sustainable agricultural practices (Uprety & Chhetri, 2024). By adhering to international commitments, Nepal can leverage global support to address its climate challenges more effectively (Havukainen, 2022).

While international agreements provide a framework, the implementation of national and local policies is essential for addressing the specific challenges posed by surging heat. In Nepal, a range of policies and strategies at various levels can help manage the impacts of extreme heat and promote climate resilience. At the national level, Nepal's climate policy includes strategies for adaptation and mitigation, which are vital for addressing heat-related issues. Effective and meaningful NDC compliance can be useful tool to address such problems (Pauw et al., 2018). For instance, the National Adaptation Plan (NAP) outlines measures to improve the country's resilience to climate change, including the development of heat action plans, the promotion of climate-resilient agriculture, and investment in infrastructure that can withstand extreme temperatures.

Local policies and initiatives are equally important in implementing effective responses to heat waves. In urban areas like Kathmandu and other municipalities in Nepal, local governments can develop heat action plans that include measures such as increasing green spaces, enhancing building codes for heat resilience, and establishing cooling centers for vulnerable populations (Sharma et al., 2022; Yadav et al., 2023). By incorporating local knowledge and addressing specific community needs, these policies can provide targeted solutions that improve public health and safety during extreme heat events (Morss et al., 2011).

Furthermore, integrating climate considerations into local development plans can enhance resilience at the community level. For example, rural communities can benefit from policies that support the adoption of climate-smart agricultural practices, such as drought-resistant crops and efficient irrigation techniques (Ariom et al., 2022). These local-level adaptations can mitigate the impact of heat on agriculture, which is a critical sector for Nepal's economy and food security (Bista, 2024; Chettri et al., 2024). Collaboration between national and local authorities is crucial for effective policy implementation. Ensuring that national strategies are translated into actionable plans at the local level requires coordination and support across different levels of government. Public awareness campaigns and community engagement are also essential to ensure that local populations understand and can benefit from climate policies and adaptation measures (Dhakal et al., 2023; Thapa & Dhakal, 2024).

International agreements like the Paris Agreement provide a global framework for addressing climate change, while national and local policies are critical for implementing specific measures to manage the impact of surging heat. For Nepal, aligning with global commitments and developing targeted policies at various levels can enhance resilience, support sustainable development, and effectively address the challenges posed by extreme heat.

Integrated development planning

Incorporating heat resilience into development plans is essential for ensuring that infrastructure, communities, and services are adequately prepared for extreme heat events. By integrating heat resilience into planning processes, governments and organizations can build systems that withstand the impacts of rising temperatures and reduce vulnerabilities. This approach involves designing and constructing infrastructure that can endure heat stress, such as heat-resistant building materials and improved cooling systems (Khan, 2022). Additionally, developing community-based strategies, such as establishing cooling centers and creating public awareness programs about heat risks, can enhance individual and collective preparedness (Hasan et al., 2021; Hess et al., 2023).

Achieving effective heat resilience requires a cross-sectoral approach that coordinates efforts across various domains, including health, infrastructure, and agriculture. For instance, in the health sector, it is crucial to implement measures that address heat-related illnesses and ensure access to medical care during extreme heat events. Public health initiatives might include setting up early warning systems and heat action plans to alert communities and healthcare providers about impending heat waves (Knowlton et al., 2014). Simultaneously, the infrastructure sector must focus on developing and maintaining resilient infrastructure that can handle heat impacts. This includes upgrading roads, buildings, and utilities to withstand high temperatures and prevent damage or disruptions (Ojo, 2024). For example, incorporating reflective materials in road construction can reduce heat absorption and lower surface temperatures, while retrofitting buildings with better insulation and cooling systems can enhance comfort and safety (Amaripadath & Sailor, 2024; Salvati, 2023).

In the agricultural sector, adapting to heat involves adopting climate-smart practices that help crops and livestock withstand higher temperatures. This can include investing in drought-resistant crop varieties, optimizing irrigation techniques, and implementing shade structures for livestock (Grigorieva et al., 2023). Coordinated efforts across these sectors ensure that each area supports the others, creating a comprehensive strategy to manage and mitigate the effects of extreme heat (Martin et al., 2022). Integrating heat resilience into

development plans and adopting cross-sectoral approaches are crucial for enhancing overall resilience to extreme heat. By addressing the challenges in a coordinated and holistic manner, communities and infrastructure can better withstand the impacts of rising temperatures, ultimately leading to more sustainable and adaptable systems.

Equity and justice considerations

Ensuring that vulnerable populations receive adequate support and resources is crucial for equitable adaptation. Recognizing and addressing disparities in heat impacts and adaptation capacities is essential for social justice (Araos et al., 2021). By integrating effective resource distribution with targeted efforts to bridge gaps in adaptation capacities, we can promote a more equitable approach to managing heat-related challenges (Andrijevic, 2021). This combined focus ensures that all communities, particularly those most at risk, have the support they need to adapt and thrive in the face of climate-related stresses (Parsons et al., 2024).

Case studies and best practices

Cities of Europe, North America and parts of Asia experienced exacerbated heat conditions due to the Urban Heat Island (UHI) effect, leading to increased energy consumption and heightened health risks in 2022 and afterwards. In Nepal, a similar phenomenon was observed, in 2023 and 2024. The government's tendency to permit densely packed construction in within government premises like Singhdurbar and other heavily populated parts of Kathmandu, as well as in provincial cities, often undermines its environmental policies. This practice frequently bypasses required Environmental Impact Assessments (EIAs) and neglects adherence to national environmental guidelines (Siwakoti, 2024). Such policy inconsistencies and the pursuit of ambitious development projects, driven by national pride projects, often overlook the environmental and public health impacts of crammed urbanization (Rimal, 2023). As a result, the negative effects of the UHI phenomenon are exacerbated, contributing to higher temperatures, increased energy demands, and greater health risks for the urban population. Nepal, with its diverse geography and climate challenges, provides valuable insights into effective adaptation strategies for vulnerable communities. Here are some notable case studies and best practices from Nepal.

Community-Based Early Warning Systems: Nepal has implemented community-based early warning systems to enhance preparedness for flood events, particularly in flood-prone areas like the Terai region. These systems leverage local knowledge and technology to provide timely alerts. Engaging local communities in monitoring and disseminating early warnings ensures that alerts are relevant and actionable (Sufri et al., 2020). Training local

volunteers as weather observers helps improve the accuracy and reliability of the warnings (Twigg, 2021). Using multiple communication channels (e.g., mobile alerts, community radios, and local announcements) ensures that warnings reach all community members, including those in remote areas (Tran et al., 2021).

Agroforestry and Sustainable Agriculture: In the hilly regions of Nepal, agroforestry practices have been adopted to enhance agricultural resilience. This involves integrating trees and shrubs into agricultural landscapes to improve soil fertility, reduce erosion, and provide shade. Incorporating a mix of fruit trees, timber trees, and shrubs helps improve soil health and provides additional income sources for farmers. Providing training for farmers on agroforestry techniques and offering technical support helps ensure successful implementation and long-term sustainability.

Water Resource Management: In response to water scarcity and irregular rainfall patterns, many rural communities in Nepal have implemented rainwater harvesting systems. These systems collect and store rainwater for use during dry periods. Involving local communities in the design and maintenance of rainwater harvesting systems ensures that they meet local needs and can be effectively managed. Combining rainwater harvesting with traditional water management practices, such as the construction of traditional ponds and check dams, enhances overall water availability and sustainability.

Disaster Risk Reduction and Resilience Building: Nepal has implemented Community-Based Disaster Risk Reduction (CBDRR) programs to enhance local resilience to natural disasters. These programs focus on building community capacity to prepare for and respond to emergencies (Bhattarai et al., 2022). Providing training on disaster preparedness and response helps communities develop skills and knowledge to manage risks effectively (Tamang et al., 2021).

These case studies from Nepal highlight innovative approaches to adaptation and resilience building in the face of climate challenges. By leveraging local knowledge, involving communities, and integrating best practices, Nepal has demonstrated effective strategies for managing climate impacts and enhancing resilience.

Successful adaptation strategies and innovative solutions

Cities like Copenhagen and Singapore have successfully tackled the Urban Heat Island (UHI) effect and improved heat resilience through a combination of strategies. Public awareness campaigns in Copenhagen have educated residents about cooling strategies and emergency preparedness, while Singapore's extensive network of parks and vertical gardens highlights the

cooling benefits of green infrastructure. Both cities have also enforced stringent building standards that promote energy-efficient designs and materials to minimize heat absorption and enhance indoor comfort. Additionally, they have embraced innovative technological solutions to further address heat challenges. Innovations offer solutions to address heat challenges (Table)

Strategy/Initiative	Description
Cool Roofs	Installing cool roofs that reflect more sunlight and absorb less heat helps to lower building temperatures and reduce energy consumption.
Reflective Materials	Using reflective materials in urban design and construction to minimize heat absorption and mitigate the Urban Heat Island (UHI) effect.
Advanced Cooling Systems	Implementing state-of-the-art cooling systems that enhance energy efficiency and provide effective cooling in heat-prone areas.
Community-Led Cooling Centers	Establishing local cooling centers managed by community groups to provide relief during extreme heat events.
Urban Greening Projects	Initiatives driven by local organizations to plant trees and create green spaces, contributing to urban cooling and improving quality of life.
Peer Education Programs	Grassroots programs that educate and empower residents to implement heat-resilient practices and advocate for local climate action.

By integrating successful strategies and innovative solutions, cities can enhance their resilience to heat challenges. Combining effective public policies, advanced technologies, and community-driven initiatives creates a robust framework for adapting to and mitigating the impacts of rising temperatures.

Future directions and research needs

As climate extremes, including surging heat events, become more frequent and intense, there is a pressing need for continued monitoring and research. Understanding evolving heat trends and their impacts on development is essential for adapting strategies and policies effectively. Enhanced Monitoring Implementing advanced monitoring systems to track changes in heat patterns and their effects on various sectors, such as public health, infrastructure, and ecosystems. Research on Impacts Investigating how increasing heat extremes influence development processes, including urban planning, economic activities, and social structures. The following table presents ideas on how to integrate future activities and approaches.

Strategy	Description
Adaptation Strategies	Refine strategies to mitigate climate extremes and support sustainable development.
Transdisciplinary Research	Collaborate across fields for a holistic understanding of heat impacts.
Enhanced Monitoring Systems	Use advanced sensors to track temperature, health outcomes, and environmental changes.
Integrated Databases	Combine meteorological, health, and socioeconomic data to better understand heat impacts.
Effectiveness Research	Evaluate and improve adaptation measures through feedback loops.

By encouraging collaboration across different fields and filling in research gaps, we can create better and more adaptable solutions for dealing with extreme heat. This broad approach helps us develop more effective strategies and make well-informed decisions, ultimately improving resilience and protecting vulnerable communities.

Given current challenges, it's essential to fully use our social, cultural, and spiritual resources, as well as our systemic structures, to address these issues comprehensively. Involving social institutions, cultural practices, and spiritual beliefs will lead to more inclusive solutions that reflect a variety of perspectives and values. This way, our responses will be more effective and better supported by the communities they aim to help. The following figure illustrates this dynamic system for managing complex and unknown situations.

Conclusion

This chapter has examined the pervasive and multifaceted impacts of rising temperatures on public health, infrastructure, agriculture, and economic stability, underscoring the imperative for integrated, forward-looking strategies. Effectively addressing these challenges necessitates a systems-based approach that recognizes the interdependencies among these sectors and the cascading consequences of inaction. A strategic response must center on resilience-building through targeted investments in climate-adaptive infrastructure, including urban green spaces, reflective materials, and sustainable cooling technologies to mitigate the Urban Heat Island effect. Enhancing energy efficiency through cutting-edge innovations and advancing climate-smart agricultural practices—such as the cultivation of heat-resistant crops and the deployment of precision irrigation—will be critical to safeguarding food security and optimizing water resource management. The escalating risks associated with rising temperatures demand not only

sustained policy engagement but also a paradigm shift towards anticipatory governance, cross-sectoral coordination, and evidence-informed decision-making. By bridging scientific insights with locally grounded interventions, stakeholders can foster a more adaptive and resilient society—one capable of withstanding the long-term ramifications of climate change while ensuring the well-being of both human and ecological systems.

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Geopolitics in the Digital Era: Navigating the Intersection of Technology and Global Power

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Introduction

This chapter explores how digital technology influences global political dynamics and how geopolitical strategies shape technological advancements. It highlights how digital innovations are transforming traditional power structures, international relations, and strategic interests. The concept of “Navigating the Intersection” underscores the importance of understanding and managing the complex relationship between technology and geopolitics.

In illustrating this dynamic, the Mahabharata demonstrates that relying solely on soft power is insufficient to counteract an enemy’s hard power advantage. Ancient and early medieval Hindu and Buddhist texts reveal the awe and fear inspired by highly realistic android robots—referred to as yantra in Sanskrit and yanta in Pali—crafted by skilled engineers known as yantrakars or yantrakaras. Notably, a female robot is featured in a Buddhist tale from the Mahavastu. Additionally, various traditions in Sanskrit, Tibetan, Chinese, and Tocharian describe how a famous inventor created a lifelike female robot, called Yantraputraka or “machine doll,” to showcase his craftsmanship (Mayor, 2018). Robotic guardians also appear in Buddhist legends involving historical figures like King Ashoka and King Ajatasatru. Greek mythology further contributes with Talos, a bronze giant considered the first “robot” to roam the world (Mayor, 2018), and explores the concept of biotech, or creating life through craft.

Cyber security

Security has been a fundamental objective of organized societies since the dawn of recorded history. Traditional weapons are designed to target military personnel and installations with precision, adhering to ethical and legal standards. In contrast, cyber weapons impact communications and computing systems on a much broader scale, often causing significant harm to civilian infrastructure. This characteristic makes cyber weapons somewhat analogous to biological and chemical weapons, as their effects can spread in unpredictable and unforeseen ways (Kissinger et al., 2021).

Technology often plays an ambiguous role in our individual and societal aspirations. Some view it as a panacea for all human problems and a boundless source of progress (Schwab & Malleret, 2022). However, as the digital domain expands due to interconnected trends, the associated risks are growing rapidly. Since 2000, the global number of internet users has surged by about 1000%, the number of internet-connected devices has skyrocketed, and the use of digital systems by individuals has led to exponential increases in data production, processing, and communication (Schwab & Davis, 2018).

In today's hyperconnected world, international security and state relations are profoundly impacted by these developments. The nature of security risks is evolving, affecting power dynamics between state and non-state actors and across geographical boundaries. In this complex geopolitical landscape, establishing a collaborative platform for addressing key international security issues has become both crucial and challenging, especially with the rise of armed non-state actors (Schwab, 2016).

Digital age

Digital transformation is a continuous process with open development. At the moment, there is undeniable uncertainty; it is unclear what path the various developments will take, and it is also unclear what probability should be attributed to the occurrence of the alternative outcomes (Lengsfeld, 2019). A fundamental conundrum of the digital age is that a society grows more susceptible the more digitally capable it is. Since people living both inside and outside of state authority may have their security and privacy compromised by both state and non-state actors, the advent of the digital era has given rise to new security issues (Pinto, 2018). However, the Internet is mostly a technological infrastructure. But as was already noted, no other modern technology has had such a profound influence on and altered our way of life. One of the fastest technological changes in history is the introduction of digital technology. In a matter of years, Facebook, Google, and Amazon have emerged as the world's most dominant corporations. The British scientist Alan Turing's seminal 1936 article serves as the foundation for the digital revolution. Turing came up with the idea for a brand-new conceptual machine that could read an endless tape. This machine was known as a universal computing machine or Turing machine (Turing, 1936). John von Neumann, who pioneered the digital revolution in 1945, envisioned the fundamental design of the contemporary computer as comprising an input and output device, a control unit, a processor unit, working memory, and external mass

storage. The first computer was designed using von Neumann's computer architecture (Neumann, 1945).

In 1947, Bell Laboratories produced the modern transistor, expanding on improvements in semiconductor knowledge made possible by radar research during World War II. In Shannon's logical circuitry, the transistor took the role of the vacuum tube, paving the way for the creation of microprocessing units with thousands, millions, and eventually billions of transistors. Integrated circuits were created in 1958 and 1961 by Jack Kilby and Robert Noyes, who discovered a method of directly etching transistors and other electronic components into silicon wafers. Faster and more potent microprocessors may now be created by stacking an increasing number of transistors on a silicon chip. The digital revolution was made possible by this miniaturization, which allowed for exponential increases in memory, processing speed, and data transfer.

In 1965, Gordon Moore, then head of Intel, an early manufacturer of integrated circuitry that would become the global pacesetter, noticed that the transistor count carved into silicon's microchip was doubling roughly every one to two years. This trend is expected to continue for the next decade (Clarke). That was half a century ago and Moore's observations and predictions proved to be prescient. The doubling time for various features of microprocessing (speed, transistor count, and cost, among others) continued a pattern of rapid geometric growth until 2010, with a recent modest slowdown compensated by gains in other dimensions of computation.

William Gibson, a science fiction author, is renowned for having popularised the word "cyberspace" with his 1984 book *Neuromancer*. In it, he paints a picture of a post-apocalyptic future in which megacorporations have essentially taken the place of nations as the world's superpowers, and "cyberspace" refers to the artificial space known as "The Matrix," a worldwide information grid full of tangible data representations (Arulmurugan & Jinnah, 2021).

Whatever the true definition of cyber is, it is a topic that is widely discussed in geopolitics, particularly when it comes to the diplomatic aspect of international peace and security as well as economic development, social and cultural issues, and law enforcement. Since 1998, the UN has been a major player in developing international peace and security discussions on cyber conflicts. The first significant UN resolution on cyber security was submitted (by Russia). The WSIS process was initiated with assistance from the UN in 2003, and it continues to be a significant state contribution to the discussion of Internet governance. The Council of Europe completed discussions on the so-called Budapest Convention on Cybercrime, and the WSIS process gave rise to the Internet Governance Forum (IGF). There are

various ways to visualize what is called the cyberspace ecosystem of various organizations, agencies, government coalitions, civil society processes, and industrial groups that play a role in the stability of cyberspace in some way.

The conflict over chips

The significance of computer chips in modern military, economic, and geopolitical power is well-documented. The US has maintained its superpower status due to its dominance in technologicis enabled by computer chips (Palma et al., 2022). The globalization of the chip industry, involving players from Taiwan , Korea, and Europe , has raised concerns about the US losing its edge (Mark & Robert, 2023). China is heavily investing in developing its own processors to comete wit US, often referred to as a “Manhattan Project” for processors. Economic historian Chris Miller narrates in his book *The Chip War* the amazing series of events that culminated in the United States’ mastery of chip design and how chips contributed to the Soviet Union’s loss (thereby rendering the Russians’ precision-guided weaponry obsolete). The struggle for dominance in this sector will impact our future. Due to their fundamental reliance on foreign chips, China imports more chips than it does oil, making them the country’s largest external risk. But the West worries that a solution is close at hand because 37% of the world’s supply of chips—manufactured in Taiwan—is within easy missile range of China (Miller, 2022).



Figure 1. Sharp Power

The international cyberspace is starting to be dominated by China, Russia, India, and the US. To better test their systems, a further dozen or so nations that are dedicated to defensive cyber operations will undoubtedly move on to acquire some basic offensive capabilities. To put it succinctly, practically all medium-sized and advanced economies are in the process of developing the means to project state power into cyberspace (Williams) (Grzegorzewski & Marsh, 2021).

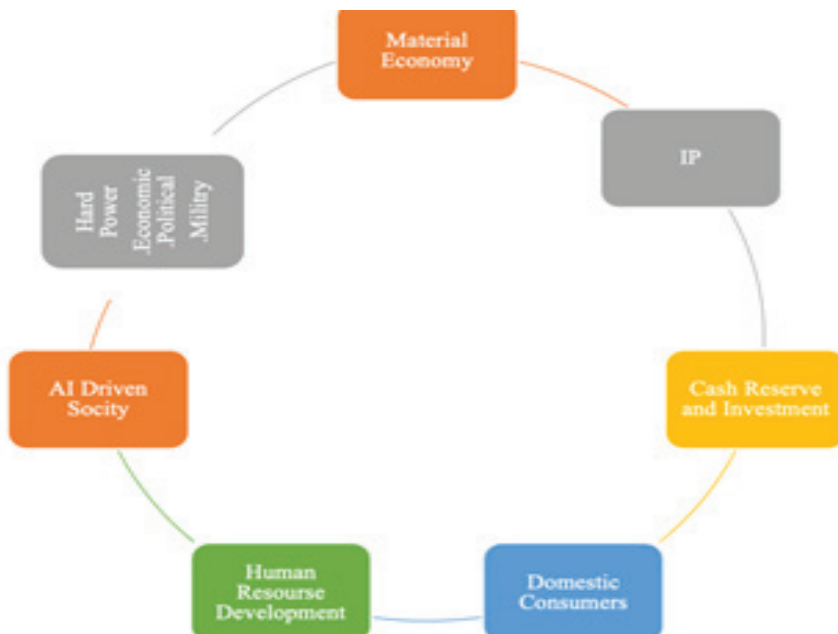


Figure 2. China's Strategy for Domination
 (Source: Malhotra 2021, pp139, The Battle for World Domination)

Before cell phones, people had to engage a private investigator to take notes if they wanted to find out why. Nowadays, that labor is meaningless because our pocket-sized cell phone takes care of everything for us. Although nobody may use this information, it is there nonetheless. Our location data is precious, and everybody wants to know about it. The real-time tracking of individuals is a whole industry. Businesses utilize our phones to track our in-store shopping habits. Cell phone providers are selling our location data to data brokers, who resell it to anybody who will pay for it since it is so valuable. The real-time tracking of individuals is a whole industry. Businesses utilize our phones to track our in-store shopping habits. serving patrons in more than 180 countries and 10,000 institutions. A device made available by the UK business Cobham enables users to make “blind” phone calls—those that are undetectable and don’t ring (Bruce, 2015).

With today’s technology, corporations and governments can monitor large populations effectively. It’s risky to conduct mass surveillance. It permits discrimination on practically any basis, including political beliefs, race, religion, and class. It’s being used to restrict our ability to accomplish things, what we can see, and eventually what we can say. This is being carried out without offering the public any genuine recourse or opt-out options, nor any significant checks and balances. It reduces our sense of security. It reduces

our freedom. The safeguards that were put in place during earlier technical regimes to keep us safe from these risks are no longer effective and are insufficient.

At least in their current form, these contracts are unfair and of poor quality, which is the issue. We have been taking things extremely lightly and not fully realizing the implications. With today's technology, corporations and governments can monitor large populations effectively. It's risky to conduct mass surveillance. It permits discrimination on practically any basis, including political beliefs, race, religion, and class. It's being used to restrict our ability to accomplish things, what we can see, and eventually what we can say. This is being carried out without offering the public any genuine recourse opt-out options, or any significant checks and balances. It reduces our sense of security and our freedom. The safeguards that were put in place during earlier technical regimes to keep us safe from these risks are no longer effective and are insufficient. It has to be fixed, and we have to do it fast.

Data as a monitoring tool

When we navigate our increasingly digitalized lives, governments and corporations gather, store, and analyze the massive volumes of data we sort through. This typically takes place without our awareness or permission. They make judgements about us based on this data that we may find offensive or disagreeable and that have a significant impact on our lives. We never mislead search engines. Compared to our friends, lovers, or family, it is closer to us. We constantly express our opinions in very precise language. Google keeps track of all of my thoughts forever, therefore it has extensive knowledge of my thoughts. I quickly and conveniently used Google Auto. This tool offers to finish typing your search terms based on what other users have typed, instantly.

Eric Schmidt, the CEO of Google, said, "We know where you are, we're aware of your whereabouts, we could be somewhat aware of your thoughts. Take a look at your own Gmail account if you have one, every time you log in, you may see your search history this will be active for as long as your account, potentially years. Try it; you'll be delighted it is highly personal if you had sent Google your journal. Furthermore, although Google lets you change your ad selections, you are not allowed to remove anything from their system (Schmidt & Cohen).

Other sources exist for private information and metadata,our purchasing patterns might tell us a lot about ourself. Our tweets reveal to the world when we go to bed each night and what time we wake up in the morning. Likewise, our political and sexual preferences are exposed via the lists of friends and address books we keep.Who is the centre of our professional,social, and romantic life is revealed by our email headers. One way to look at it is to think of metadata as background and data as content. According to Stewart Baker, a former general counsel for the NSA(US) metadata tells us everything about someone's life.

The goal of government surveillance is to gather information on as many individuals as possible from the minimum number of individuals required. Even though monitoring was costly and labor-intensive,it was only appropriate in dire circumstances.Police monitoring is restricted by the warrant system,while national intelligence surveillance is restricted by the possibility of source interception and discovery. A specific group of persons was the focus of surveillance,and only the most data was gathered on them. Strict minimal guidelines were also in place regarding the collection of no other people's data.

The automated monitoring

We make every effort to opt out, but we still end up with a rather high level of automatic surveillance. This occurs as a result of our interactions with other people, who are under observation.if you don't have a personal account on Facebook,but you do have a professional profile where you don't post or friend people.It keeps non-Facebook users' profiles up to date in its database. When you visit a page with a Facebook "Like" button, it follows You. Based on the tagged photos,it can reasonably infer who my friends are,and it can have profiles connected to additional data that it has bought from different data brokers. Facebook may poll you via your friends and websites that have Like buttons. Everybody is constantly being observed, and the information is being saved indefinitely. It appears to be a surveillance state akin to the information era,and it is far more effective than Bentham could have imagined (a panopticon).

The integration of institutional control

The government and corporate supervision functions are same.They are related to one another and mutually supportive. It is a global cooperation for public-private monitoring. It's more of an alliance of interests than a

formal contract. With the support of numerous influential parties, it has solidified into reality even though it is not absolute. Additionally, despite the fact that Snowden's disclosures regarding NSA spying have damaged the relationship, it is evident from his documents just how much the NSA depends on American businesses to access the Internet. No extensive internet spying system has been created by the NSA from the ground up. It noticed that the business sector was in the process of creating one and took advantage of it. The NSA legally compels Internet giants like Microsoft, Google, Apple, and Yahoo to make the data of thousands of interested parties available through initiatives like PRISM. The NSA has direct access to the Internet backbone through other programmes, allowing it to monitor everyone in the world. These companies occasionally cooperate with the NSA voluntarily.

Blue Coat, a US-based company, provides business networks with surveillance and content filtering systems. These technologies are also utilised for government monitoring in Burma, China, Egypt, Indonesia, Nigeria, Qatar, Saudi Arabia, Turkey, and Venezuela. The censoring product Netsweeper, developed by a Canadian corporation, is employed by the governments of Pakistan, Yemen, the United Arab Emirates, Somalia, and Qatar. The American corporation McAfee's SmartFilter, which is widely used in schools, assists the governments of Tunisia and Iran in controlling the Internet. Similarly, the American company Fortinet uses filtering software to censor the Internet in Burma. The commercial security technologies of the UK company Sophos to monitor and apprehend their citizens in Syria and other authoritarian regimes.

The government's monitoring

We have to acknowledge that the government has legitimate purposes for monitoring, including intelligence and law enforcement needs. More importantly, we must support authorised surveillance, and these organisations must act in the ways that are mandated of them, respecting citizens' rights to privacy, security, and freedom from unwarranted suspicion and observation. There is a widespread fear of cyber attacks in governments around the world. There are many risks, but there are real risks. And the cyber defense is stuck in the classic collective action problem. Much of the infrastructure of cyberspace is in private hands, but most of the damage from a large cyber attack will be felt by the entire population. That means it won't work in the long term to trust the companies that control our infrastructure to adequately protect that infrastructure. Some form of government involvement is required. There is a genuine need for innovative concepts, instruments, and technology.

Our laws are derived from certain geographic areas. It made perfect sense throughout the majority of human history. In the case of the internet, which is very globalised, it makes less sense. Although we must abide by the laws of the nation in which we currently reside, things become more difficult when we use the internet. The regulations of the nations in which our software vendor, online cloud application provider, and hardware manufacturer are based will all have an impact on us. The laws of the nation in which our data is stored as well as any other nation where it is sent over the Internet have an impact on it. For instance, the Patriot Act compels American businesses to send data to the country when the government requests to know where it is kept. Microsoft can only keep our email on servers located in Ireland, even if we are a French national residing in France. However, Microsoft, an American corporation, has stated that it is required to release our data upon request in the United States. This implies that we must make a decision on which nations and businesses may trust with our personal information.



Figure 3. Cybershield Insights (Source: Irudaya Praveen)

AI and war

Cyberattacks, on the other hand, happen online without the need for gunfire or explosives. This is essentially not the same as modern combat, which is quickly turning into cyberwarfare—a blend of lethal force and digital skills. The United Nations said in March 2021 that military-grade autonomous drones, capable of flying to a predetermined area, selecting their own targets, and carrying out a kill without the aid of a remote human operator, had been used in combat for the first time in history in Libiya in March 2020. The Nagorno-Karabakh conflict initially showed signs of an interstate modern warfare that was essentially cyberattacked in September 2020 (Schwab & Malleret, 2022). The US, UK, NATO, Microsoft, and Poland have all provided military support for the recent Ukrainian conflict. Whereas, Microsoft is not a country. This demonstrates the role of the actors paradigm change in conflict as well (Bremmer, 2024).

Just before Christmas Eve on December 23, 2015, Cut off Ukraine's electricity and heat in the thick of winter, what better method to incite unrest and raise doubts about the new leadership among the people, Russia crossed the Rubicon in the digital realm. Trapdoors and virtual explosives planted by Russian hackers in Ukraine's government institutions and media outlets for months had also been covertly implanted in the country's power plants. They compromised the computers that manage Ukraine's electrical system that December, methodically turning off circuit breakers one by one until millions of people were left without electricity. They disconnected the emergency phone lines just to be safe. To make matters worse, they also cut off backup power to the distribution centres in Ukraine, forcing workers to take cover in the dark.

By employing degrees of obfuscation never before observed by forensic investigators, the Ukrainian attackers went to tremendous measures to conceal their true address. They routed their attacks through compromised servers in Singapore, the Netherlands, and Romania. It was a hit piece in politics. Numerous confirmations came from security researchers in the months that followed. They discovered the attackers' aims after tracking the attack back to a reputable Russian intelligence group. The goal of the attack was to instill in the minds of the Ukrainian people the notion that Russia was powerful, that their government was ineffective, and that Putin's cyber troops were so entrenched in every corner of the country that Russia could turn off the lights whenever it pleased.

And even if that message was unclear, in December of 2016, Russian hackers once more brought down the power in Ukraine. This time, however, they staged a protest by turning off the electricity and heat in Kiev, the nation's capital. China and Russia are America's two most formidable cyber foes, according to estimates from the National Intelligence Agency. China absorbed much of the oxygen, not so much because of its skill as just because its hackers were too strong to pilfer trade secrets from the United States. Keith Alexander, the former head of the National Security Agency, referred to Chinese cyber espionage as the largest money transfer in history. Every piece of intellectual property worth stealing from the United States was being pilfered by the Chinese and given to their state-owned businesses to replicate (Eliana).

North Korea and Iran ranked highly on the list of cyberthreats. They both declared their intention to hurt America. Following Sands CEO Sheldon Adelson's open call for Washington to strike Iran, Iran took control of computers at the Sands casino in Las Vegas, crippled American financial websites, and, in a series of ransomware assaults, kidnapped American enterprises, hospitals, and entire communities (Danya, 2012). After Hollywood offended Kim Jong-un's taste in films, North Korea set fire to American servers. Later, Jong-un's cyber thugs stole \$81 million from a Bangladeshi Bank.

Moved Russian cybercriminals one step closer to detonating a cyberexplosion. In addition to hacking the US grid, they bombed the Brexit referendum and meddled in the Holy Olympics, the World Anti-Doping Agency, the US and French elections in 2016.

The assault by Russia on the electrical grid of Ukraine has ushered in a new era of cyberwarfare. However, such attempts in 2015 were nothing compared to what transpired two years later when Russia obtained the NSA's most sophisticated hacking capabilities. Using NSA cyberweapons, Russia launched the most costly and damaging cyberattack in recorded history against Ukraine on June 27, 2017. Everywhere in Ukraine, people woke up to black screens that afternoon. They were unable to make payments, send or receive mail, use ATMs to withdraw cash, pay for gas at stations, purchase rail tickets, buy groceries, or—perhaps most terrifying of all—check the radiation levels at Chernobyl (Nicole, 2021).

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The Russians launched their virus throughout the globe using the NSA's pilfered code as a propellant. Merck and FedEx will have to pay \$1 billion for the hack. Over \$10 billion in losses were estimated to have resulted from a single Russian strike in 2019, and the figure was still rising. The capacity of the rail and transport infrastructures is still underutilised. Shipping tracking systems fell down, and people all throughout Ukraine were still searching for misplaced shipments. Pension checks that had been withheld during the attack were still unpaid. Who was in debt was removed from the records.

The terrible moniker "NotPetya" was given to the attack by security researchers. They later learned that NotPetya was actually a piece of non-ransomware created by Russian hackers, despite their original assumption that it was Petya ransomware. Retrieving any data was impossible even if you paid the ransom. It was "a nation-state weapon intended to cause mass destruction." However, most people in that 2019 winter felt that NotPetya was the Kremlin's most audacious project to date. It was the 21st-century equivalent of Chernobyl (Barnum, 2017).

It is crucial to keep in mind where China's relationship with the Internet started, even as we consider where it might go in the near future. Online freedom has surpassed offline freedom for Chinese citizens since the early 2000s, when the first widely used online community was created. Political arguments have long played a significant role in the conversations of netizens, who are generally critical of government actions. The term "netizen" is a straight translation of the Chinese term "wangmin," which means "people of the net". Officials and governments tend to be very nationalist, though this is not always the case.

Chinese bloggers have carried out notable campaigns that can be characterised as political, despite the fact that the word is a little misleading given the rise of microblogging sites like Weibo in recent years. Corrupt officials and their families are the target of many of these efforts.

Without a question, the state's efforts to regulate the internet have not only progressively increased since Xi Jinping assumed power in 2013 but have also changed from being based on restriction and punishment to being based on propaganda and rewards. President Xi implemented extensive internal and exterior cyber-power tool changes between 2013 and 2015, all of which are obviously directed towards the principal objective of consolidating Chinese cyber power to uphold internal stability. This could be accomplished through coercion of the most dangerous segments of society, such as bloggers, hackers, and netizen elites, or even through economic means or widespread content control aimed at the general public.

There has been much discussion, particularly in recent years, over the extent and true consequences of Chinese intellectual property theft and financial crimes, particularly in relation to the United States. Without a question, the state's efforts to regulate the internet have not only progressively increased since Xi Jinping assumed power in 2013 but have also changed from being based on restriction and punishment to being based on propaganda and rewards. President Xi implemented extensive internal and exterior cyber-power tool changes between 2013 and 2015, all of which are obviously directed towards the principal objective of consolidating Chinese cyber power to uphold internal stability. This could be accomplished through coercion of the most dangerous segments of society, such as bloggers, hackers, and netizen elites, or even through economic means or widespread content control aimed at the general public. There has been much discussion, particularly in recent years, over the extent and true consequences of Chinese intellectual property theft and financial crimes, particularly in relation to the United States.

The challenges of development

Converging growth and reducing poverty suggest that the world economy is emerging from its current state of turmoil. With the advancement of technology, poverty may now be eradicated and the international order is being rebalanced in a way that benefits nations outside of the North Atlantic. However, it would be misguided to become complacent, as global anxiety levels are rising and signal more serious issues. There are three main hazards associated with the digital era.

The first global risk, given the promise of ending poverty through appropriate use of technology, is a sharp and unstable rise in economic disparity. Economic progress has not produced equally distributed benefits. In many

nations, notably the US and China, inequality has grown in tandem with economic expansion. The income of workers who are being replaced by robots and artificial intelligence is stagnating or declining, while that of certain people—particularly those with advanced degrees—is rising. In theory, higher incomes can make up for people who are left behind; yet, in the US and many other nations, there is relatively little income redistribution. The catastrophic global environmental disaster is the second global risk. Numerous interrelated global environmental shocks have been left behind by two centuries of fast economic growth. The first is global warming brought on by human activity, which is caused by large-scale atmospheric emissions of greenhouse gases that absorb heat. The primary offender is carbon dioxide (CO₂), which is released when fossil fuels are burned.

With all of the world's weapons in place, war is the third global threat. Right now, a big country going to war may seem unthinkable because of how horrible and destructive the outcome would be. But in 1910, “the same was said about the possibility of a major war on the eve of the First World War.” As it was expected in 1910, the general consensus now is that there won't be any more major power wars for an indefinite period of time. However, historical evidence indicates differently. Every new globalisation age that is followed by a significant change in geopolitical power is almost always accompanied by conflict. In the upcoming years, we need to put in tremendous effort to promote peacebuilding in order to steer clear of the conflict cycles that have historically been destructive.

The three main issues that have prompted many scientists, moral leaders, and governments to call on the world to embrace sustainable development are inequality, the environmental crisis, and the precariousness of peace. From economic growth to social inclusion, environmental sustainability, and peaceful society, the notion itself advocates for a comprehensive approach to globalisation. Market-based growth can never be sufficient, according to the philosophy of sustainable development and the history of globalisation. The global economic system has been a brutal, violent affair, with inequality and war not being essentially resolved, since the start of capitalist globalisation in the 1500s. Furthermore, the environmental problems we face today are more intricate, global in scope, and unique to our species. We're putting the planet in peril in ways we've never seen before because we don't have a roadmap for how to go.

The challenge of inequality

Technological innovations contain the seeds of increased inequality, since new technologies create market winners and losers. The spinning jenny and power loom displaced and impoverished India's numerous spinners and weavers. The mechanisation of agriculture impoverished thousands small farmers worldwide, who "fled to the cities in search of a living." The introduction of robots into vehicle assembly lines has resulted in unemployment and wage losses for workers laid off from those facilities. And now comes the digital economy, with more better computers and systems to accomplish the activities that workers formerly did. Who wins and who loses? In general, future labour market winners will be those with high-level abilities that robots cannot replace, or those with the ability to collaborate with new intelligent machines, such as technical skills for programming new machines.

The losers will be workers whose jobs are easily replaced by robots and artificial intelligence. Over the past forty years, job losses have been concentrated in the commodity-producing sectors, especially in agriculture, mining and manufacturing. Job losses will continue in the future. Both agriculture and mining are becoming increasingly automated, with self-driving vehicles such as tractor combines and large excavators and transportation equipment at mine sites. Robots continue to replace workers on factory floors in many production areas. And it seems clear that other jobs in the service sector will also disappear in the future. Trucks and taxis could well become self-driving, displacing millions of commercial drivers. Warehouses are increasingly being operated with robot carrying, stacking, and packaging of merchandise. And retail stores are giving way to e-commerce and direct delivery of purchases, again with specialist systems and potentially self-driving delivery vehicles.

The losers will be workers whose jobs can be easily replaced by robots and artificial intelligence. Over the last four decades, job losses have been concentrated in commodity-producing industries, including agriculture, mining, and manufacturing. Job losses will continue into the future. Agriculture and mining are becoming more automated, including self-driving vehicles like tractor combines, huge excavators, and transportation equipment on mine sites. Robots continue to replace workers on factory floors in a variety of manufacturing domains. And it appears that more service-related employment may disappear in the future. Trucks and taxis could potentially become self-driving, eliminating millions of commercial drivers. Warehouses are increasingly being operated with robots that transport, stack,

and package items. Retail storefronts are making way to e-commerce and direct delivery of orders, aided by specialised technology and maybe self-driving delivery vehicles.

In recent decades, low-skilled workers displaced by machines have seen their incomes stagnate or fall, while high-skilled workers have been made more productive by the same machines. They have seen their income increase. These trends have been the main cause of rising income inequality in many countries, including, in particular, the United States. However, the final impact of this trend depends on two additional factors. To the extent that low-skilled workers can acquire higher skills through increased education and training, the proportion of the labor force suffering from stagnant or declining incomes can be reduced. And even as market wages are pushed down, the government can compensate for those adverse market forces by increasing taxes on those with high and rising incomes and by increasing transfers to those with low and falling incomes, so that all segments of society can share in the benefits from technology.

In recent decades, low-skilled workers who have been replaced by machines have seen their wages stagnate or fall, while high-skilled people have seen their productivity increase. They've seen their income rise. These developments have been the primary driver of increased income disparity in numerous countries, including the United States. However, the ultimate consequence of this tendency is dependent on two additional considerations. Low-skilled workers can gain higher skills through increasing education and training, reducing the fraction of the labour force with stagnant or declining salaries. Even as market wages are pushed down, the government can compensate for those adverse market forces by increasing taxes on those with high and rising incomes and increasing transfers to those with low and falling incomes, allowing all segments of society to share in the benefits of technology.

Development challenges may also extend to the world's poorest countries, as those countries typically rely on labor-intensive export earnings to finance their future economic growth. However, the digital revolution is replacing low-cost labor with smart machines. For example, rapid advances in robotics have resulted in the automation of jobs in textiles and clothing, which in the past were stepping-stone industries for low-wage countries climbing the ladder of economic development. While the digital revolution will certainly help poorer countries in certain areas - such as low-cost healthcare, expanded educational opportunities, and improvements in infrastructure - the digital

revolution can also cut off traditional pathways to economic development. In that case, global solidarity, where rich countries provide more development assistance to poor countries to enable them to invest in new digital technologies as well as skills, could be important.

Conclusion

While the digital age has accelerated global economic growth, it has also amplified several systemic challenges. The rapid advancement of technology has contributed to significant wealth generation, yet this prosperity is unevenly distributed, exacerbating socioeconomic inequalities between high and low skilled workers.

Moreover, diplomatic efforts and digital governance frameworks provide mechanisms for managing rising geopolitical tensions. By leveraging these tools, the global community can navigate the complexities of the digital age, promoting sustainable economic development, social cohesion and geopolitical stability.

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China's Belt and Road Initiative (BRI): Perspective of Nepal

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The Kathmandu Post

The Belt and Road Initiative (BRI) is facing multiple questions in Nepal. The text of the framework agreement signed in 2017 is yet to be made public by the government¹. So, it lacks informed debate among the politicians, leaders, lawmakers, public intellectuals and others². Out of five priority areas, namely — policy coordination, infrastructure, trade, financial modality and people-to-people connectivity³, Nepali side is still in a dilemma on how to deal with policy coordination and financial modality. Policy coordination seems vague and ambiguous because it does not entail whether China wants to have policy coordination in its entire relations with Nepal or only what we have signed under the BRI framework. There is also a divergence of views and opinions regarding investment modality.

No serious talks in the last seven years on how to remove the bottlenecks and clear the misunderstandings on various issues that have entangled execution of the BRI in Nepal were initiated⁴. No talks, brainstorming sessions and discussions at the political and diplomatic level on how to take forward the BRI were initiated. The Nepal side has taken BRI at face value and understands it as a basket of funds where it will receive the money to fund the projects apart from deep diving into political, philosophical, strategic and other aspects of the BRI. That ambiguity clearly reflects how Nepal proposed 35 projects and later trimmed them down to nine and why some of them were even disliked by the Chinese⁵.

Nepal's journey towards BRI began as soon as China announced the setting up of the Silk Road Fund in 2014. The participation as founding members of the AIIB in 2015⁶, the visit of former President Bidhya Devi Bhandari to China⁷ and back and forth visits of several leaders from both sides paved the way for creating an environment for the signing of the BRI. Over three dozen high and medium-level visits took place from Kathmandu and Beijing in 2016

1 <https://ekantipur.com/news/2024/11/21/the-bri-agreement-of-seven-years-ago-is-still-secret-21-11.html>.

2 <https://english.pardafas.com/bimalendra-nidhi-bri-agreement-requires-national-level-discussion-before-signing/>.

3 <https://www.ebrd.com/what-we-do/belt-and-road/overview.html>.

4 <https://www.orfonline.org/expert-speak/china-fails-to-push-bri-implementation-plan-in-nepal>.

5 <https://kathmandupost.com/national/2019/01/18/nepal-trims-projects-under-bri-from-35-to-9-at-chinese-call>.

6 <https://kathmandupost.com/money/2015/06/30/nepal-signs-pact-becoming-founding-member-of-aiib>.

7 <https://mofa.gov.np/press-release-on-the-state-visit-of-rt-hon-president-to-china-day-6/>.

until the BRI framework agreement was signed in May 2017⁸. The Chinese persuasion was a major contributing factor behind Nepal's decision to join the BRI, as well as its appetite to see funds for large and medium infrastructure and connectivity-related projects, among others. The growing proximity of Nepali communist leaders towards Beijing after the Indian blockade was also the major factor behind Nepal's decision to join the initiative⁹. Several agreements signed during Prime Minister Oli's visit to China in 2016 were directed towards Nepal's acceptance towards BRI, including the Trade and Transit Agreement. Since China was receiving rousing responses from small and developing nations following the announcement of the One Belt One Road (OBOR), which was later renamed BRI, that paved the way for Nepal to sign the agreement¹⁰. From the Indian blockade to the rise of leftist forces in Nepal, Nepal's own interest in getting more funds and investment for different projects triggered the Nepali side to sign the agreement. Against China's expectation, no high-level committee was formed to execute the BRI. Nepal's way of selecting projects haphazardly, China's own strategic ambiguity and Nepal's own conundrum over the overall idea of BRI are to blame for the delay¹¹. The delay in finalizing the BRI implementation plan is also causing the delay. It has been on the table since the end of 2019, but both sides have yet to agree on a common template. There is a divergence of views on agreeing on the text of the BRI implementation plan.

Current development in BRI

Without agreeing on a BRI implementation plan, the Chinese side has also clarified that it will not negotiate the projects. From 2014 to 2024, Nepal's journey towards the BRI was arduous, difficult and confusing¹². During the official visit of Prime Minister Pushpa Kamal Dahal to China in September last year and the recent visit of Deputy Prime Minister Narayan Kaji Shrestha to China, the implementation plan of the BRI got huge traction once again, but no concrete decision was taken¹³. It was former Prime Minister Sher Bahadur Deuba who first opened the draft document of the BRI implementation plan and communicated Nepal's position in a subtle way during the visit of Wang Yi in 2022¹⁴. The Prime Minister was under pressure from the Chinese side to sign the BRI implementation plan and tasked the vice chairman of the National Planning Commission with finalizing the text. However, due to internal and external pressure, the prime minister could not dare to sign the

8 <https://kathmandupost.com/national/2017/05/12/nepal-china-sign-framework-deal-on-obor>.

9 <https://myrepublica.nagariknetwork.com/news/ncp-cpc-sign-mou-pledging-to-further-deepen-sisterly-ties/>.

10 <https://mofa.gov.np/joint-press-statement/>

11 <https://kathmandupost.com/national/2024/06/26/funding-modalities-differences-delay-bri-execution-deal>.

12 <https://kathmandupost.com/national/2024/05/13/7-years-on-nepal-and-china-still-at-odds-over-bri-execution>.

13 <https://mofa.gov.np/joint-statement-between-the-peoples-republic-of-china-and-nepal/>.

14 <https://kathmandupost.com/national/2022/03/27/wang-visit-nepal-china-sign-nine-agreements-none-on-bri>.

BRI implementation plan. In the joint statement, it was written that “both sides will soon” finalize the text of the BRI implementation plan and will sign it¹⁵. There is also a lack of transparency over the implementation plan, no wider consultation with different government stakeholders and some of the provisions in the text of the implementation plan are causing difficulties for Nepal to agree on the text forwarded by the Chinese side¹⁶. The text has not been readied yet. Negotiations are going on. Identifying the project is under consideration. No deadline to sign the implementation plan has been fixed during the prime minister’s visit. After the prime minister ditched the political partnership with the Nepali Congress, once again, the BRI implementation plan got traction and focus. Deputy Prime Minister and Minister for Foreign Affairs Narayan Kaji Shrestha, who is a vocal supporter of the signing of the BRI implementation plan, visited China¹⁷. His visit was a water test for the BRI implementation plan, but it could not generate that momentum in China. He talked and assured us that BRI implementation will be signed, but there is no deadline and no commitment. Rather his counterpart, Wang Yi asked repeatedly about the longevity of the government. Later, the meeting of foreign secretary level between Nepal and China also discussed the signing of the BRI implementation plan¹⁸. The Pushpa Kamal Dahal cabinet gave the final approval to the plan but the plan was shelved at the last moment.

Nepal’s prime concerns on BRI

There is a funding conundrum. The introduction of the “Silk Road Roadster” in Nepal in July last year, Nepal’s position on loans, soft loans, grants, competitiveness, interest rate, repayment, issue of partnership, and opaque response from the Chinese side on some of the reservations over implementation plan are causing major concerns¹⁹.

The issue of the Nepal-China Free Trade Agreement (FTA), the provision of Policy Exchange, selecting the project and refraining from being aligned with the security and military strategy has also come to the table sometimes in Kathmandu. Because the document’s sub-section number 12 titled ‘Other Areas’ under section 3 named ‘Cooperation Priorities’ mentions, among other things, “the two sides will strengthen legal cooperation and actively carry out diverse legal exchanges and capacity building in order to facilitate B&R cooperation”. It also says, “The two sides will implement relevant agreements on law enforcement cooperation and strengthen security cooperation through joint training, information exchange, and capacity building, including

15 <https://mofa.gov.np/joint-statement-between-the-peoples-republic-of-china-and-nepal/>.

16 <https://kathmandupost.com/national/2024/11/21/congress-and-uml-scramble-to-resolve-differences-over-bri>.

17 <https://kathmandupost.com/national/2024/01/28/bri-implementation-plan-will-be-signed-soon-dpm-shrestha-says>

18 <https://kathmandupost.com/national/2024/06/25/nepal-china-may-ink-bri-implementation-plan-today>

19 <https://kathmandupost.com/national/2023/07/19/china-launches-silk-roadster-projects-under-bri-in-nepal>.

disaster management”. Some government officials and some external forces have expressed their reservations over this particular provision²⁰.

The strategic implications for some sections of the political class are there. The concerns over the debt trap are also there²¹. Nepal’s position and China’s opaque response are primary concerns. The possible geopolitical fallout after advancing the BRI is also causing uneasiness in Kathmandu.

Domestic debacle on BRI (narratives, understanding, stands, polarization etc)

As mentioned above, the text of the BRI framework agreement and BRI implementation plan are yet to be out, preventing the informed debate inside Nepal at parliament among the think tanks and public intellectuals. Narratives are not that divisive but there is no clarity within the political parties, no serious discussion within the political parties, within the state mechanisms and with China. There is less understanding about BRI if we compare the similar kind of controversy like Millennium Challenge Cooperation (MCC) and others²². No major political parties of Nepal are that much negative with the BRI but no one is taking a lead to break the logjam. It has failed to polarize the society like MCC debate, discussion and deliberation. The Dahal government was seen as pro-China, and some of the ruling party leaders are vocal about BRI, but they have failed to suggest how to execute it²³.

Nepal’s stress is on the project, while China wants to have something in writing, something to complete the agreement at the top political level in written form, as well as something that has legal bindings. Party-wise, the Nepali Congress has very cautious views on BRI²⁴. It is of the view that as the BRI framework agreement was signed after a larger political consensus among the major parties of Nepal, similarly, the signing of the BRI implementation plan should be ensured in a similar fashion.

The CPN—UML and CPN (Maoist Centre) want to see its execution but do not offer any logical ground on how and why²⁵. Those who became the finance ministers from these two parties offer different views on BRI. The Rastriya Swatantry Party, Rastriya Prajatantra Party and other fringe parties have not made any position public on BRI and how to implement the initiative²⁶. The Mahanta Thakur—led Loktantrik Samajbadi Party has recently stood against the BRI. China’s one-sided declaration that Pokhara

20 <https://eastasiaforum.org/2024/08/31/china-nepal-strategic-partnership-stumbles-over-bri-and-boundary-issues/>

21 <https://www.cfr.org/blog/rise-and-fall-bri>.

22 <https://kathmandupost.com/national/2020/01/09/why-the-mcc-compact-court-controversy-in-nepal>.

23 <https://myrepublica.nagariknetwork.com/news/bri-implementation-to-advance-with-priority-pm-dahal/>.

24 <https://english.pardafas.com/nepali-congress-rejects-loans-under-chinas-bri-pushes-for-grant-assistance-ahead-of-pm-olis-visit-to-beijing/>.

25 <https://kathmandupost.com/politics/2024/07/19/nepal-can-t-backtrack-on-bri-says-uml-leader>

26 <https://english.khabarhub.com/2024/17/413412/>.

International Airport is the flagship project of the BRI has irked the political and bureaucratic leadership, so China is also not less responsible for delaying the execution of the BRI.

Geopolitics of BRI in Nepal (what it means for other geopolitical actors/ their perception and efforts), impacts and risks

Geopolitics was always there. Some countries were not happy when Nepal signed the BRI in 2017. While assessing those concerns from within and outside the country, Nepali leaders said it was done with a larger consultation and no compromise was made. It was Minister Prakash Sharan Mahat of Nepali Congress who negotiated the BRI draft over the months and publicly claimed that maximum national interest was ensured while negotiating the draft with the Chinese side and no undue influence was tolerated in signing the agreement²⁷. Several portions and proposals forwarded by the Chinese side were either rejected or amended when we signed the BRI framework agreement in 2017. With the MCC debate and controversy, along with adversaries like fake news, misinformation, disinformation and information disorder, there is also a greater risk of being the victim of the same information disorder regarding BRI²⁸. Nepal's immediate neighbours, India, the United States of America and the aligned bloc have been advising the government to be cautious while choosing the project, be cautious while taking loans and grants and make sure that Nepal will not face another debt trap issue like some Asian, African and nations from other continents are facing²⁹. The MCC debate further exacerbated the BRI discourse in Nepal and demanded greater transparency like in MCC. The power corridors were full of speculation that India and the Western bloc had thwarted the prime minister's plan to sign the BRI implementation plan during his visit to China. There is enormous pressure, concerns and red flags being raised by the geopolitical actors in Kathmandu in favour and against the BRI³⁰. This is one major element that BRI is not taking off well in Nepal. The geopolitical actors closely follow the development in Kathmandu, so any alteration of the BRI besides its original spirit will be seriously raised. The risk is always there. The idea of taking forward the less strategic project under the BRI is the first choice of India and the Western bloc if Nepal wants to move ahead with the BRI. They will definitely protest and advise the government not to opt for the expensive projects that will risk Nepal in the vicious cycle of debt and debt servicing arrangements.

27 <https://kathmandupost.com/national/2024/04/26/nepal-should-have-same-yardstick-for-development-and-economic-cooperation-with-all-nations-says-mahat> .

28 <https://medium.com/disinformation-in-nepal/usa-nepal-mcc-compact-and-chinese-disinformation-279f076e199c>.

29 <https://www.aa.com.tr/en/asia-pacific/china-to-waive-loans-for-african-nations/3326577>.

30 <https://asiasociety.org/policy-institute/nepals-geopolitical-crossroads-balancing-china-india-and-united-states>.

Other initiatives (GSI/GCI/GDI) – Chinese push, Nepal’s position, implications (security, strategic, geopolitical).

After the BRI, China has come up with other series of initiatives, one after another, as a subsidiary or subordinate to the BRI. Nepal is getting calls to join all three latest Chinese initiatives, but as of now, the Nepal government has decided to take support under the Global Development Initiative³¹. Since Global Development Initiative (GDI) is aligned with the UN’s SDG, the Nepal government has accepted the support. But officially, the government of Nepal has not made any position public on Global Security Initiative (GSI) and Global Civilizational Initiative (GCI)³². The Chinese unilateral announcement of organizing the Dragon Boat Festival in Pokhara last year under the banner of Global Civilizational Initiative drew a lot of attention and criticism³³. There was uneasiness and discomfort within the establishment about China’s unilateral announcement of organizing the function under the GCI. Nepali authorities, time and again rejected the idea of joining the Global Security Initiative due to Nepal’s stated foreign policy that it will not join or take support from any military and security initiative. In all high—level visits, the Chinese side has been asking Nepali officials to join GCI and GSI³⁴. And there is no in—depth study on GCI and GSI and their possible implications because our civilization is something different from the Chinese civilization. There is also a lack of clarity on what China wants to achieve out of it and what it entails for Nepal. On GCI, Nepal’s position is clear. However, Nepal continuously faces pressure and requests from the Chinese side to become part of the GCI and GSI³⁵. Nepal needs to look after any kind of social, security and military wise spillover effect across the other side of the once we will sign these agreements.

Conclusion

There will be a future push for BRI and other initiatives, potential navigating options for Nepal, a future trajectory of BRI implementation, and concerns for Nepal (future scenarios). China’s rise, geopolitical factors, past accords and agreements, the left government in Kathmandu, negotiation, national consensus, project selection, transparency, funding modality, and geopolitical considerations are some of the factors that will determine the future trajectory of the BRI in Nepal.

(Note: This article was submitted before the BRI implementation plan was signed.)

31 <https://kathmandupost.com/national/2022/09/23/two-nepal-projects-selected-under-china-s-gdi>.

32 <https://kathmandupost.com/national/2023/09/25/nepal-seeks-to-sidestep-china-s-gsi-request>.

33 <https://english.khabarhub.com/2023/29/308904/>

34 <https://kathmandupost.com/national/2023/06/14/china-seeks-nepal-s-support-for-gsi-and-gci>.

35 https://baijiahao.baidu.com/s?id=1768536483177156684&wfr=spider&for=pc&utm_source=substack&utm_medium=email.