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Preface

South Asia, subregion of Asia, consisting of the Indo-Gangetic Plain and peninsular India. It includes the countries of Bangladesh, Bhutan, India, Pakistan, Nepal, and Sri Lanka; Afghanistan and the Maldives are often considered part of South Asia as well. The term is often used synonymously with "Indian subcontinent," though the latter term is sometimes used more restrictively to refer to Bangladesh, India, and Pakistan.

South Asia, in the limited sense of the term, consists of the Indo-Gangetic Plain, peninsular India, and Sri Lanka. The Indo-Gangetic Plain is formed from the combined alluvial plains of the Indus, Ganges (Ganga), and Brahmaputra rivers, which lie in a deep marginal depression running north of and parallel to the main range of the Himalayas. It is an area of subsidence into which thick accumulations of earlier marine sediments and later continental deposits have washed down from the rising mountains. The sediments provide fertile soil in the Ganges and Brahmaputra basins and in irrigated parts of the Indus basin, while the margins of the Indus basin have become sandy deserts. Peninsular India and Sri Lanka are formed of platform plateaus and tablelands, including the vast Deccan plateau, uplifted in the Mesozoic and Cenozoic. The region includes tablelands with uplifted margins, such as the Western and Eastern Ghats, and terraced and dissected plateaus with lava mantles or intrusions.

Migration types are not neutral on its impact on population and development. In Asia, due to lack of political agreement on long-term and permanent migration schemes, such as green cards, migration consists mostly of 'guest workers' on short-term contracts that can be extended.

India has enhanced its engagement with all SAARC countries both bilaterally and through the South Asian Association for Regional Cooperation (SAARC). It has increased efforts for enhancing trade and connectivity links through land, air and sea for accelerating regional integration and greater people-to-people contacts. India continues its efforts to build peaceful cooperative ties with Pakistan to address the outstanding issues through peaceful bilateral dialogue.

South of the mountains is the Indo-Gangetic Plain, formed from the combined alluvial plains of the Indus, Ganges (Ganga), and Brahmaputra rivers, which lie in a deep marginal depression running north of and parallel to the main range of the Himalayas. It is an area of subsidence into which thick accumulations of earlier marine sediments and later continental deposits have washed down from the rising mountains. Studying the geography of South Asia can also be a way to better understand the people who created or commissioned works of art.

Both India and Pakistan have internal disputes between states and provinces over water management. In India, Delhi, Haryana, Himachal Pradesh, Punjab and Rajasthan all dispute the sharing of water from the Sutlej and Yamuna rivers and the associated link canal. Madhya Pradesh and Bihar dispute rights to the Son river, while Madhya Pradesh and Uttar Pradesh argue over the construction of the Rajghat dam on the Betwa river.

South Asia covers diversified climatic zones and experiences an array of climate change impacts. Human pressures together with changing hydrology and land resources have distinct impact on the production of food grain and resilience of ecosystems. The most threatened areas are grasslands and mountain forest ecosystems of the Himalayas and ecosystems of the Sundarbans. Forests of South Asia having most biologically diverse ecosystems on the planet are destroyed due to rapid deforestation and urbanization.

This book attempts to explore the possiblity of discovering the roots of unity of the South Asian countries.

—*Dr. Udhav Eknath Chavan*

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South Asia as Territorial Entity

Even during this period of social distancing and public lockdown, claims and counterclaims over territories in and around the Kalapani region (located at the tri-junction between northern India, western Nepal and southern China/Tibet) have resurfaced to become an issue that has embroiled India and Nepal in a political debate; it is now gravitating towards a confrontational trend of popular politics. Therefore, it is pertinent to look at our South Asian mentalities as to how such disputes are "handled" rather than "addressed" within the given dispensation of South Asian statecraft.

State as sole arbiter

One of the major problems of South Asian politics is that it has to flow from within a state-centric paradigm. State-centrism, within the assumption of a South Asia, has given the state structure the propriety to be the sole arbiter of disputes, if any, among communities and regions falling within the territorial limits of nation states. It is the state that articulates, defines, and represents "national" interests in negotiations with other states. Experience suggests that states in South Asia consecrate political boundaries as the "natural" shield even in the arbitration of South Asian affairs. Interestingly, this "realist" fashion of statecraft happens to be the dominant South Asian pattern within which territorial

boundaries are valued more than lives, livelihoods and the well-being of the people located at the edges of nation states. "Patriotism" looms large as and when inter-state relationships are viewed through the statist lens, although "jingoism" might be missing. Myopic hostility, real or imagined, is used as the governing principle in the arbitration of territorial disputes across South Asia.

Contested idea

Basically, the term "region" seems to be a contested idea in a South Asian context as none of the South Asian states has ever recognised and respected the idea of regional identity or regional politics, while becoming suspicious of such natural cleavages in politics. Given that this is a reality, how could one even think of South Asia as a region to reckon with? One must understand that South Asia is perhaps the most natural regional grouping of states around the world. And, at the same time, it is also the most difficult and contested grouping. South Asia needs to be rethought, not as a region of states, but as a region of regions. As such it demonstrates itself more as a borderland that needs to be cultivated out of contact zones which exist beyond the limits of territorial boundaries shared by the member-states.

Life here is fluid

Such a perspective is necessary in order to address the contemporary crisis that has emerged from the Kalapani dispute. There is a need to go beyond the popular debates (couched in the language of "myopic hostility") revolving around such "troubling" questions such as: how much area has been "encroached" upon by which state and on what basis. Such questions appear to be "normal" in the way a "statist paradigm" deals with the issue; but they seem to be "troubling", if not "haunting", questions to those who are to maintain their lifeworld at those zones which are inexplicable to a "realist" or a "neo-realist" statist paradigm.

South Asian life, essentially at the edges of the nation state, is bound to be fluid because the boundary, which confirms the territorial limits of a nation state, is at the same time the affirmed threshold of another nation state. In a certain sense, the people living at the edges of nation states within South Asia do not

actually belong to any of the two nation states. Or in other words, they belong to both the states at the same time. Non-sedentary practices define their life courses, while switching positionalities animate their aspiration of belonging. Plurality, differences and inclusivity bring coherence to borderland ontology; they defy the logic of singular, unifying, exclusive identities that the nation states privilege.

Impact on cooperation

Howsoever real the "realist" positions may be, borderlands act as natural vessels to de-essentialise the statist paradigm. As places of habitation, such spaces are more real than what the "realist" positions of statecraft might make out of them — for those who live in them. Administrative treaties and tribunals represent them as spatial categories; but as lived spaces, they hardly fit into the protocols of a statist paradigm. This is crucial especially when we know that as countries, both India and Nepal not only share cultural and civilisational backgrounds but also an "officially" recognised porous border.

Unless both India and Nepal agree to see the reality beyond the gaze of the statist paradigm, they are going to endanger the future of other regional experiments such as the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) or the Bangladesh, Bhutan, India, Nepal (BBIN) sub-regional initiative. South Asian states need to realise the difference between "regional cooperation" merely as advocacy and as an issue that demands self-approval and self-promotion.

There is every likelihood that South Asian countries would remain busy in making tall claims of regional cooperation while closing all doors of recognising difference and mutual tolerance. In the commotion that ensues, powerful countries operating within and beyond the orbit of South Asia might become successful in establishing their control by using the same token of "regional cooperation" as an issue of realpolitik.

Both India and Nepal, and for that matter, other South Asian countries need to rethink South Asia as a region of regions before they submit to the enticements of a new language of "regional cooperation" — one that is ontologically empty but materially

more rewarding. Region and regional identity are not just issues of "realpolitik" in South Asia; rather, the need is to "officially" accommodate this rather naturally drafted way of doing politics, if we are genuinely concerned about South Asian geopolitics.

SOUTH ASIA

South Asia is the southern region of Asia, which is defined in both geographical and ethno-cultural terms. The region consists of the countries of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Topographically, it is dominated by the Indian Plate and defined largely by the Indian Ocean on the south, and the Himalayas, Karakoram, and Pamir mountains on the north. The Amu Darya, which rises north of the Hindu Kush, forms part of the northwestern border. On land (clockwise), South Asia is bounded by Western Asia, Central Asia, East Asia, and Southeast Asia.

The South Asian Association for Regional Cooperation (SAARC) is an economic cooperation organisation in the region which was established in 1985 and includes all eight nations comprising South Asia. South Asia covers about 5.2 million km (2.0 million sq mi), which is 11.71% of the Asian continent or 3.5% of the world's land surface area. The population of South Asia is about 1.891 billion or about one-fourth of the world's population, making it both the most populous and the most densely populated geographical region in the world. Overall, it accounts for about 39.49% of Asia's population, over 24% of the world's population, and is home to a vast array of people.

In 2010, South Asia had the world's largest populations of Hindus, Muslims, Sikhs, Jains and Zoroastrians. South Asia alone accounts for 98.47% of Hindus, 90.5% of Sikhs, and 31% of Muslims worldwide, as well as 35 million Christians and 25 million Buddhists.

Definition

Modern definitions of South Asia are consistent in including Afghanistan, India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and Maldives as the constituent countries. Afghanistan is, however, considered by some to be a part of Central Asia, Western Asia,

or the Middle East. After the Second Anglo-Afghan War, it was a British protectorate until 1919. On the other hand, Myanmar (formerly Burma), administered as part of the British Raj between 1886 and 1937 and now largely considered a part of Southeast Asia as a member state of ASEAN, is also sometimes included. But the Aden Colony, British Somaliland and Singapore, though administered at various times under the British Raj, have never been proposed as any part of South Asia. The region may also include the disputed territory of Aksai Chin, which was part of the British Indian princely state of Jammu and Kashmir, now administered as part of the Chinese autonomous region of Xinjiang but also claimed by India.

The geographical extent is not clear cut as systemic and foreign policy orientations of its constituents are quite asymmetrical. Beyond the core territories of the British Raj or the British Indian Empire, there is a high degree of variation as to which other countries are included in South Asia. There is no clear boundary – geographical, geopolitical, socio-cultural, economical or historical – between South Asia and other parts of Asia, especially the Middle East and Southeast Asia.

The common definition of South Asia is largely inherited from the administrative boundaries of the British Raj, with several exceptions. The current territories of Bangladesh, India, and Pakistan which were the core territories of the British Empire from 1857 to 1947 also form the core territories of South Asia. The mountain countries of Nepal and Bhutan, two independent countries that were not part of the British Raj, and the island countries of Sri Lanka and Maldives are generally included. By various definitions based on substantially different reasons, the British Indian Ocean Territory and the Tibet Autonomous Region are included as well. The 562 princely states that were protected by but not directly ruled by the British Raj became administrative parts of South Asia upon joining India or Pakistan.

The South Asian Association for Regional Cooperation (SAARC), a contiguous block of countries, started in 1985 with seven countries – Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka – and admitted Afghanistan as an eighth member in 2007. China and Myanmar have also applied for the

status of full members of SAARC. The South Asia Free Trade Agreement admitted Afghanistan in 2011.

The World Bank and United Nations Children's Fund (UNICEF) recognizes the eight SAARC countries as South Asia, The Hirschman–Herfindahl index of the United Nations Economic and Social Commission for Asia and the Pacific for the region excludes Afghanistan from South Asia. Population Information Network (POPIN) excludes Maldives which is included as a member Pacific POPIN subregional network. The United Nations Statistics Division's scheme of sub-regions, for statistical purpose, includes Iran along with all eight members of the SAARC as part of Southern Asia.

The boundaries of South Asia vary based on how the region is defined. South Asia's northern, eastern, and western boundaries vary based on definitions used, while the Indian Ocean is the southern periphery. Most of this region rests on the Indian Plate and is isolated from the rest of Asia by mountain barriers. Much of the region consists of a peninsula in south-central Asia, rather resembling a diamond which is delineated by the Himalayas on the north, the Hindu Kush in the west, and the Arakanese in the east, and which extends southward into the Indian Ocean with the Arabian Sea to the southwest and the Bay of Bengal to the southeast.

The terms "Indian subcontinent" and "South Asia" are sometimes used interchangeably. The Indian subcontinent is largely a geological term referring to the land mass that drifted northeastwards from ancient Gondwana, colliding with the Eurasian plate nearly 55 million years ago, towards the end of Palaeocene. This geological region largely includes Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Historians Catherine Asher and Cynthia Talbot state that the term "Indian subcontinent" describes a natural physical landmass in South Asia that has been relatively isolated from the rest of Eurasia.

The use of the term Indian subcontinent began in the British Empire, and has been a term particularly common in its successors. South Asia as the preferred term is particularly common when scholars or officials seek to differentiate this region from East Asia. According to historians Sugata Bose and Ayesha Jalal, the Indian subcontinent has come to be known as South Asia "in more recent

and neutral parlance." This "neutral" notion refers to the concerns of Pakistan and Bangladesh, particularly given the recurring conflicts between India and Pakistan, wherein the dominant placement of "India" as a prefix before the subcontinent might offend some political sentiments. However, in Pakistan, the term "South Asia" is considered too India-centric and was banned until 1989 after the death of Zia ul Haq. This region has also been labelled as "India" (in its classical and pre-modern sense) and "Greater India".

According to Robert M. Cutler – a scholar of Political Science at Carleton University, the terms South Asia, Southwest Asia, and Central Asia are distinct, but the confusion and disagreements have arisen due to the geopolitical movement to enlarge these regions into Greater South Asia, Greater Southwest Asia, and Greater Central Asia. The frontier of Greater South Asia, states Cutler, between 2001 and 2006 has been geopolitically extended to eastern Iran and western Afghanistan in the west, and in the north to northeastern Iran, northern Afghanistan, and southern Uzbekistan.

The definitions are also varied across South Asian Study programmes. The Centre for South Asian Studies at the University of Cambridge was established, in 1964, it promoted the study of India, Pakistan, Sri Lanka, Bangladesh, Afghanistan, the Himalayan Kingdoms (Nepal, Bhutan, and Sikkim), and Burma (now Myanmar). It has since included Thailand, Malaysia, Singapore, Vietnam, Cambodia, Laos, Indonesia, the Philippines and Hong Kong. The Centres for South Asian Studies at both the University of Michigan and the University of Virginia include Tibet along with the eight members of SAARC in their research programs, but exclude the Maldives. The South Asian Studies Program of Rutgers University and the University of California, Berkeley Centre for South Asia Studies also include the Maldives.

The South Asian Studies Program of Brandeis University defines the region as comprising "India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, and in certain contexts Afghanistan, Burma, Maldives and Tibet". The similar program of Columbia University includes Afghanistan, Bangladesh, India, the Maldives, Nepal, Pakistan, and Sri Lanka in their study and excludes Burma. In the

past, a lack of a coherent definition for South Asia resulted in a lack of academic studies, along with a lack of interest for such studies. Identification with a South Asian identity was also found to be significantly low among respondents in an older two-year survey across Bangladesh, India, Nepal, Pakistan, and Sri Lanka.

GEOGRAPHY

According to Saul Cohen, early colonial era strategists treated South Asia with East Asia, but in reality, the South Asia region excluding Afghanistan is a distinct geopolitical region separated from other nearby geostrategic realms, one that is geographically diverse. The region is home to a variety of geographical features, such as glaciers, rainforests, valleys, deserts, and grasslands that are typical of much larger continents. It is surrounded by three water bodies – the Bay of Bengal, the Indian Ocean and the Arabian Sea – and has acutely varied climate zones. The tip of the Indian Peninsula had the highest quality pearls.

Indian Plate

Most of this region is resting on the Indian Plate, the northerly portion of the Indo-Australian Plate, separated from the rest of the Eurasian Plate. The Indian Plate includes most of South Asia, forming a land mass which extends from the Himalayas into a portion of the basin under the Indian Ocean, including parts of South China and Eastern Indonesia, as well as Kunlun and Karakoram ranges, and extending up to but not including Ladakh, Kohistan, the Hindu Kush range and Balochistan. It may be noted that geophysically the Yarlung Tsangpo River in Tibet is situated at the outside of the border of the regional structure, while the Pamir Mountains in Tajikistan are situated inside that border.

The Indian subcontinent formerly formed part of the supercontinent Gondwana, before rifting away during the Cretaceous period and colliding with the Eurasian Plate about 50–55 million years ago and giving birth to the Himalayan range and the Tibetan plateau. It is the peninsular region south of the Himalayas and Kuen Lun mountain ranges and east of the Indus River and the Iranian Plateau, extending southward into the Indian Ocean between the Arabian Sea (to the southwest) and the Bay of Bengal (to the southeast).

Climate

The climate of this vast region varies considerably from area to area from tropical monsoon in the south to temperate in the north. The variety is influenced by not only the altitude but also by factors such as proximity to the seacoast and the seasonal impact of the monsoons. Southern parts are mostly hot in summers and receive rain during monsoon periods. The northern belt of Indo-Gangetic plains also is hot in summer, but cooler in winter. The mountainous north is colder and receives snowfall at higher altitudes of Himalayan ranges. As the Himalayas block the north-Asian bitter cold winds, the temperatures are considerably moderate in the plains down below. For the most part, the climate of the region is called the Monsoon climate, which keeps the region humid during summer and dry during winter, and favours the cultivation of jute, tea, rice, and various vegetables in this region.

South Asia is largely divided into four broad climate zones:

- The northern Indian edge and northern Pakistani uplands have a dry subtropical continental climate
- The far south of India and southwest Sri Lanka have an equatorial climate
- Most of the peninsula has a tropical climate with variations:
  - Hot subtropical climate in northwest India
  - Cool winter hot tropical climate in Bangladesh
  - Tropical semi-arid climate in the center
- The Himalayas and most of the Hindu Kush have an Alpine climate

Maximum relative humidity of over 80% has been recorded in Khasi and Jaintia Hills and Sri Lanka, while the area adjustment to Pakistan and western India records lower than 20%–30%. Climate of South Asia is largely characterized by monsoons. South Asia depends critically on monsoon rainfall. Two monsoon systems exist in the region:

- The summer monsoon: Wind blows from the southwest to most parts of the region. It accounts for 70%–90% of the annual precipitation.
- The winter monsoon: Wind blows from the northeast. Dominant in Sri Lanka and Maldives.

The warmest period of the year precedes the monsoon season (March to mid June). In the summer the low pressures are centered over the Indus-Gangetic Plain and high wind from the Indian Ocean blows towards the center. The monsoons are the second coolest season of the year because of high humidity and cloud covering. But, at the beginning of June, the jetstreams vanish above the Tibetan Plateau, low pressure over the Indus Valley deepens and the Intertropical Convergence Zone (ITCZ) moves in. The change is violent. Moderately vigorous monsoon depressions form in the Bay of Bengal and make landfall from June to September.

Climate change in South Asia is causing a range of challenges including sea level rise, cyclonic activity, and changes in ambient temperature and precipitation patterns.

Land and water area

This list includes dependent territories within their sovereign states (including uninhabited territories), but does not include claims on Antarctica. EEZ+TIA is exclusive economic zone (EEZ) plus total internal area (TIA) which includes land and internal waters.

Languages

There are numerous languages in South Asia. The spoken languages of the region are largely based on geography and shared across religious boundaries, but the written script is sharply divided by religious boundaries. In particular, Muslims of South Asia such as in Afghanistan and Pakistan use the Arabic alphabet and Persian Nastaliq. Till 1952, Muslim-majority Bangladesh (then known as East Pakistan) also mandated only the Nastaliq script, but after that adopted regional scripts and particularly Bengali, after the Language Movement for the adoption of Bengali as the official language of the then East Pakistan. Non-Muslims of South Asia, and some Muslims in India, on the other hand, use their traditional ancient heritage scripts such as those derived from Brahmi script for Indo-European languages and non-Brahmi scripts for Dravidian languages and others.

The Nagari script has been the *primus inter pares* of the traditional South Asian scripts. The Devanagari script is used for over 120 South Asian languages, including Hindi, Marathi, Nepali,

Pali, Konkani, Bodo, Sindhi and Maithili among other languages and dialects, making it one of the most used and adopted writing systems in the world. The Devanagari script is also used for classical Sanskrit texts.

The largest spoken language in this region is Hindustani language, followed by Bengali, Telugu, Tamil, Marathi, Gujarati, Kannada, and Punjabi. In the modern era, new syncretic languages developed in the region such as Urdu that are used by the Muslim community of northern South Asia (particularly Pakistan and northern states of India). The Punjabi language spans three religions: Islam, Hinduism, and Sikhism. The spoken language is similar, but it is written in three scripts. The Sikh use Gurmukhi alphabet, Muslim Punjabis in Pakistan use the Nastaliq script, while Hindu Punjabis in India use the Gurmukhi or Nâgarî script. The Gurmukhi and Nagari scripts are distinct but close in their structure, but the Persian Nastaliq script is very different.

English, with British spelling, is commonly used in urban areas and is a major economic lingua franca of South Asia.

Religions

In 2010, South Asia had the world's largest population of Hindus, about 510 million Muslims, as well as over 25 million Buddhists and 35 million Christians. Hindus make up about 68 percent or about 900 million and Muslims at 31 percent or 510 million of the overall South Asia population, while Buddhists, Jains, Christians and Sikhs constitute most of the rest. The Hindus, Buddhists, Jains, Sikhs and Christians are concentrated in India, Nepal, Sri Lanka and Bhutan, while the Muslims are concentrated in Afghanistan (99%), Bangladesh (90%), Pakistan (96%) and Maldives (100%).

Indian religions are the religions that originated in the Indian subcontinent; namely Hinduism, Jainism, Buddhism and Sikhism. The Indian religions are distinct yet share terminology, concepts, goals and ideas, and from South Asia spread into East Asia and southeast Asia. Early Christianity and Islam were introduced into coastal regions of South Asia by merchants who settled among the local populations. Later Sindh, Balochistan, and parts of the Punjab region saw conquest by the Arab caliphates along with an influx of Muslims from Persia and Central Asia, which resulted in spread

of both Shia and Sunni Islam in parts of northwestern region of South Asia. Subsequently, under the influence of Muslim rulers of the Islamic sultanates and the Mughal Empire, Islam spread in South Asia. About one-third of the world's Muslims are from South Asia.

POST-COLONIAL AND POST-PARTITION SOUTH ASIA

South Asia as a post-colonial as well as a post-partition region has a lot to offer to those interested in the geopolitical triad of bordering, ordering and othering (van Houtum and van Naerssen 2002). Several of these practices – that feed into and are in turn fed by boundary producing formal and popular narratives – continue to unfold on a sub-continent that eminently qualifies as ecologically-geographically connected but remains geopolitically partitioned, and are yet to be theorized. The Janus-faced nature of South Asian borderlands – the inward nationalizing inclinations entangled with the outward regional frontier-orientations – are a stark reminder of the reality that is often overlooked: the history of mobility in this part of the world is much older than the history of territoriality.

The geopolitical triad or triangle mentioned above (i.e. bordering, ordering and othering) comes with a heavy price tag for the inhabitants of the sub-continent, especially for those communities whose homeland landed in a suddenly erupted borderland in the wake of the 1947 partition of British India, which caused the death of nearly one million people and more than ten million were displaced. Whose territory was being partitioned in 1947 (Chaturvedi 2005) is a question that remains unanswered even today.

It is useful to acknowledge at the outset that contemporary South Asia is, paradoxically, both a rich and poor region due to the mismatch between opportunities and capacities. It is a region where people across borders are culturally and socially interrelated but this commonality is not reflected in state-to-state relations of two nuclear powers – India and Pakistan. South Asia is both one of the fastest-growing and one of the least integrated regions of the world. It is also a region of contrasts, marked by both optimism

and pessimism and features many intricacies. This dichotomy of strength and weakness, security and insecurity, hope and fear with connections and disconnects is a remarkable, if not unusual, feature of South Asia and gives birth to borders and boundaries with different kinds of territoriality. Some of the enduring legacies of this partition include truncated territories, economies, cultures and unforgettable memories. As pointed out by Ranabir Samaddar (2005, 95), there was "[N]ot one partition, not even two, not even three…but several partitions…partitions of several territories, several units, several identities and several visions".

How does one capture the *idea* of South Asia? On its radical side, social theorist Ashis Nandy would even question the idea of South Asia. For Nandy,

[T]he idea does not fit the self-image and ambitions of the states in the region. South Asia's constituent nation-states are modelled on the pre-Second –World- War nation-states of Europe, the kind that builders of nation-states in South Asia came to know during their formative years in colonial times. (Nandy 2005, 541)

The political acrimony in South Asia continues to overshadow the prospects of economic linkages and trade flows, despite occasional sparks of hope. More than politics and economics, it is the cultural moorings that unite South Asia. Ironically, South Asian states ignore the cultural affinity while making efforts for political and economic integration (Ahmed 2012). The negation of socio-cultural linkages further eclipses the prospects of overcoming political divisions. Thus, in South Asia, boundaries and borders acquire utmost prominences, confining societies to the lines of separations drawn by the power elites. At times there are notional changes but again territoriality bounces back in one form or the other. In the words of Passi, "de-and re-territorialization occur in various institutional practices and discourses and display economic, cultural and political power relations" (Passi 2011, 18). This is true in the case of South Asia as well.

With existing boundaries and borders adding substantially to adversities faced by the South Asians, especially border communities, many would hope on both the sides of the diving line that hopefully, in not too distant a future, South Asian states would bridge the borders and blur the political boundaries. Some

simple statistics do strengthen the argument in support of integration. Despite a decline in poverty in South Asia it is next to Sub-Saharan Africa in the terms of numbers of poor (Deyshappriya 2019). As many as 130 million South Asians live in informal settlements. Except for Sri Lanka –ranked 71– none of the South Asian countries are in the top 100 on Human Development Index. South Asia is also one of the most disaster-prone regions in the world with high vulnerability to global warming and climate calamities (Chaturvedi and Doyle 2015; Chaturvedi and Sakhuja 2016). These realities of South Asia pose a question: Can we remodel or even reimagine contemporary South Asia with fewer borders and boundaries?

There are material conditions that kindle hope and the economic growth experienced by the region is a silver lining (World Bank 2017). This positive economic growth in the form of sustainable development is likely to receive support from young South Asians. The demographic dividend of South Asia is a natural advantage in comparison to many regions on the face of the globe. In simple terms, "more than 12 million new workers will join the labour force every year, for the next two decades" (Ghani 2012). South Asia today is at a crossroads, facing huge opportunities as well complex challenges. Integration across national boundaries and borders through trade, cooperative diplomacy and people to people contacts is steadily turning into a matter of necessity rather than choice.

South Asian Boundaries and Borders: Comparative and Critical Perspectives

Hard borders embody and represent political anxieties between neighbours. Likewise, boundaries – both mental and material – are indicators of socio-political divides between the people. In South Asia, borders and boundaries affect the everyday life of millions in profound manner. South Asia borders are "agents of active politics" (Banerjee 1998, 191). At times, it is these borders that solely influence foreign and security policies of the states in South Asia (Tripathi 2019). In South Asia, borders acquire a political shape and remain integral to domestic political discourses (Tripathi 2015). To understand the criticality of these borders in South Asia we also need to explore, in a geo-historical perspective, how borders

were created in the region. Borders are like human beings having their histories that are region-specific (Tagliacozzo 2016). As observed by Schendel and Maaker "[M]any of Asia's borders owe their existence to colonial state making and the violent histories that this involved". In South Asia, most of the present day borders were demarcated by the British to overcome their security anxieties. These borders, therefore, are the result of war, conflict and victories while sometimes they were drawn as an outcome of diplomatic efforts and administrative convenience.

India-Nepal border is a good example of how initially war and then diplomacy led to the creation of a border between these two countries. The formal demarcation of India-Nepal borders started after the Anglo-Nepali war in 1814. Later, the border between India and Nepal was consolidated, owing to Nepal's help to British during the 1857 "mutiny" in India, and Nepalese troops joining the British in the World War-I (Tripathi 2019). There are other examples showcasing how social realities were ignored and arbitrary lines drawn in South Asia. The controversial Durand line is another reflection of British strategic interests in the South Asian border making process. Durand line between Pakistan (Pre-1947 United India) and Afghanistan politically divided people of the same ethnicity, turned Afghanistan into a "buffer state", thereby, consolidating the British control over India.

In South Asia, some of the colonial political themes are not only retained but also refurbished. The "cartographic anxiety" (Krishna 1994) that is quite visible in South Asia, can be described as a legacy of the British colonial rule. In the case of India, we can see how borders continue to play a central role in contemporary national politics and remain a cause for concern and contestation both for the state and the people. India's international border is the third-longest in the world, and she shares both her land and maritime borders with almost every South Asian country. Immediately after independence from the British Colonial rule India had witnessed a violent partition. British India was divided into two countries, India and Pakistan. Not satisfied with the partition, Pakistan expressed its discontent over the drawing of borders and to this date makes claims on Kashmir. Moreover, the setback to India in the 1962 war with China only added to India's distress and concerns over the security of her borders. It is important

to note that "[T]he theme of perceived indispensability of 'secure' or 'inviolate' borders for national development, in fact for nationality itself is not limited to politics. In the Indian society it is a recurring theme" (Krishna 1994, 511).

The most prominent expression of obsession with borders in South Asia manifests in the form of militarization of Siachen glacier, which in all respects is exceptionally hostile for human habitation. The Indian army during the operation codenamed as "Meghdoot" sent troops to set up bases on the glacier. India blamed Pakistan for provocation by allowing mountain expedition to the Siachen glacier and by distributing maps showing it as a part of Pakistani territory. While Pakistan's intentions could be questioned, India's policy of keeping troops at a place that is almost 18,000ft above the sea level is considered equally questionable by many (Nair 2009). Ignoring humanitarian concerns, such as casualties due to frost bites, India has justified the presence of its troops on the Siachen glacier. This is a good example of how national security concerns completely dominate border issues in South Asia.

India-Bangladesh border is another illustration of border politics in the region. These two neighbours do not have hostile political relations but border problems at times make things acrimonious. India-Bangladesh border is the fifth longest land border in the world with some unique characteristics like conclaves. Owing to its geographical stretch, large numbers of people are directly and indirectly dependent on this border region. As true for many other parts of the world, India-Bangladesh border has its peculiar economy connecting the dwellers of both sides. Sometimes these ground realities are ignored by states. India is fencing the border on its side with Bangladesh citing security concerns to check infiltration. New Delhi decided to fence the India-Bangladesh land borders in 2012 and as per the official report, "[T]he total length of Indo-Bangladesh border sanctioned for fencing is 3326.14km; out of which about 2731km of fencing has so far been completed (31. 12. 2016)" (Government of India 2016, 37). These fences again symbolise the general sensitivity, bordering anxieties, towards borders in South Asia. In South Asia, borders are overwhelmingly viewed as a matter of national security.

It is a truism that it takes two to make a boundary and a "secure" and securitizing border cannot be sustained for a long time without convincing justification from either side. In a region that is culturally so connected it is even harder to keep people apart and divided. This is where psychological-mental borders become so important to territorially bounded statecraft and boundary sustaining practices. Once "we" are convinced about an impending threat, we view people on the other side of the border with suspicion. This is also true in the case of South Asia where states have devised several methods to keep people separated from each other. Nationalist and populist rhetoric by the political leadership of different South Asian states appears to be a daily affair. Some of the popular methods for creating mental borders include state-sponsored propaganda through media and other means. A closer analysis further reveals how several boundaries are created by societal practices that surround everyday life in South Asia. Caste discrimination, religious fundamentalism, patriarchy, economic deprivation etc. are some of the common visible boundaries that exist throughout the region.

SUSTAINABLE DEVELOPMENT IN SOUTH ASIA

South Asian countries while sharing similar geographical and cultural features, are also very diverse: the region has the country with the second largest population in the world (India), a small island state (Maldives), an island nation (Sri Lanka), land-locked countries (Nepal and Bhutan), two nuclear power states (India and Pakistan), and a country located on a river delta (Bangladesh). They are very rich in biological diversity as the region is home to many tropical rainforests and world heritage sites. South Asia is home to well over one fifth of the world's population and is one of the most densely populated areas of the world. Most countries in the region are prone to conflict and political instability and are also plagued by poverty and corruption. Sri Lanka enjoys the highest GDP per capita and the highest literacy rate in the region while India alone accounts for 5.6 million child deaths per year. According to the World Hunger Index, the region also has the highest child malnutrition rate in the world.

The south Asian region accounts for five per cent of the world's land but houses 20 per cent of the global population. The population density is the highest with 260 people per sq. km. in contrast to the global average of 44 people per sq. km. Also poverty is widely prevalent with one third of the population living under one dollar a day. To add to this, the effects of climate change have been on the rise in this part of the globe. The erratic weather patterns, retreating Himalayan glaciers causing frequent floods and droughts coupled with the diverse ethnic beliefs and internal conflicts further complicate adaptation measures and pose significant threat to national and human security. South Asia is a zone of instability with unstable governments and inter and intra state conflicts. It is also home to some of the poorest countries in the world. In addition to the existing conflicts, climate change throws up new challenges in the form of water scarcity and resultant water disputes and also other national security issues along the unsettled boundaries. On the other hand, India is fast industrializing, and has made tremendous strides in the field of science and technology – it even made its mark on the moon recently. Bangladesh and Nepal are among the poorest countries in the world while the Maldives, consisting of atolls barely above the sea level, is a tourist haven. While Sri Lanka was the first country in the region to liberalize its economy its development efforts have been undermined by the 25 year old civil war that ravaged the country. Tensions have always been high between the two nuclear powers – India and Pakistan. India, by far the largest and the most populous country in the region, has naturally been its dominant political power.

In South Asia there are at least forty-seven million people living in highly vulnerable Low Elevation Coastal Zonesin Bangladesh, India and Pakistan. These zones include one of the most populous delta regions of the world—and megacities such as Mumbai, Kolkata, Dhaka and Chennai—where some areas are only 2–10 metres above the current sea level. As flooding and drought increase in frequency, this will have devastating impacts on livelihoods, and slow economic growth within the countries of South Asia, thereby increasing the number of people living in poverty and the number of triggers for displacement and forced migration. Small farmers living in the coastal zone are particularly

vulnerable to storm surges, salt water ingress, and flooding which damages crops and creates conditions for seasonal attacks by insects and rats. Rural wage labourers are even more vulnerable to climate changes as their opportunities for employment will be reduced and as they will have fewer assets to sustain their households during times of disasters. In urban areas, poor households are particularly vulnerable as their members are forced to live in 'high risk areas' due to a lack of affordable housing and to a lack resources needed for adaptation to changing climatic conditions. Effective responses to climate-related displacement need to be informed by a robust research base, with a strong and dynamic social science approach bringing together local, regional and international knowledge and experience.

Data shows that there is a sharp increase in the number of natural calamities with extreme weather events like cyclones or droughts. With a broad coastline and millions calling it home the loss of life will be monumental. Over the past forty years, there have been as many as 1333 disasters in South Asia that claimed 980,000 lives, affecting another 2.4 billion people and causing an economic loss of $105 billion. This number is only set to go higher with further increase in flooding due to the melting glaciers followed by droughts as the Himalayan rivers, once perennial, become seasonal. So, collective action is the way forward with substantial financial and technological help from the developed countries. The South Asian Association for Regional Cooperation (SAARC) the regional grouping of 8 countries has recognized climate change as a key issue to be dealt with at a regional level during their third meeting in Nepal in 1987 and has constituted various committees to look into the affects and suggest mitigation measures. But as a result of various factors like lack of political will, consensus and other priority issues not much substantial has happened since. The broad outcome of all the factors in this region is large scale migration and displacement. Eighty per cent of Bangladesh is prone to submergence due to floods and any sea level rise will result in submergence of a large part of its coastline. This will result in distress migration and scramble for scarce resources. For instance, in 1998, Bangladesh was flooded and submerged from few days to several months resulting in more than a 1000 deaths, half a million homes damaged and about 30

million people displaced. The loss only went up north in November 2007 as cyclone Sidr, the worst cyclone since 1991, battered Bangladesh again killing 3000 people and affecting over seven million people. Similarly Pakistan too is highly flood prone as was witnessed in July 2010. In addition, the sectorial strife, ethnic unrest and political instability can break down the entire federal machinery which might be filled by fundamental elements, a geopolitical nightmare. Other countries in the region Bhutan, Nepal and Sri Lanka too are no different. The disaster management in the region is inadequately prepared to tackle these challenges and there is no gender based approach to address the plight of women, children and other backward societies. A study of the recent flood in Dhaka, Bangladesh reinforces this point where more women lost their lives as they couldn't swim and did not have proper facilities in relief camps such as closed bathing spaces and shelters.

India has been traditionally vulnerable to natural disasters on account of its unique geo-climatic conditions. Floods, droughts, cyclones, earthquakes and landslides have been a recurrent phenomenon. About 60% of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8% of the total area is prone to cyclones and 68% of the area is susceptible to drought. A natural hazardous has been happened in Kedarnath valley due to torrential rainfall during 16 and 17 June 2013. From 14 to 17 June 2013, the Indian state of Uttarakhand and adjoining areas received heavy rainfall, which was about 375 per cent more than the benchmark rainfall during a normal monsoon. This caused the melting of Chorabari Glacier at the height of 3800 metres, and eruption of the Mandakini River which led to heavy floods near Gobindghat, Kedar Dome, Rudraprayag district, Uttarakhand, Himachal Pradesh and Western Nepal, and acute rainfall in other nearby regions of Delhi, Haryana, Uttar Pradesh and some parts of Tibet. The range of climate change impacts in South Asia includes: water shortages, increased salinity, inundation of low lying cities, less water for agriculture, soil erosion, increased incidence of disease, extreme weather events and loss of endemic species. These coupled with poverty and conflict, reliance on an agricultural economy and lack of infrastructure and other social safety nets, make the situation rather bleak. *TERI* in its report summarizes the situation:

Challenges in South Asia

Across South Asia there are various 'hot spots' where it is predicted that climatic changes will have a very large impact. These 'hot spots' are: the Eastern Ganges Basin; the major river deltas (i.e. the Ganges-Brahmaputra, the Indus and the Kaveri); the arid zones in Afghanistan, Pakistan and Western India; the Deccan Plateau; the middle hills of the Himalaya and the High Himalayan regions; and coastal areas affected by salinity, extreme storms and sea-level rise. Across the Ganges basin, the specific vulnerabilities to which climate change contributes are droughts, floods, super cyclones and other storms, and sea-level rise. The entire basin is heavily dependent on the monsoonal system. In the upper reaches, the Himalayan glaciers, which provide the winter flows, are experiencing changes in melting rates and density.

Bangladesh will be one of the most severely affected countries because nearly eighty per cent of its total land area is prone to flooding. Every year approximately twenty to twenty-five per cent of the country is inundated by floods from rivers, heavy monsoonal rainfall and storm surges, worsened by poor drainage and haphazard development in urban areas. But with increasing frequency, floods are inundating much larger areas. For example, in 1998, about 80 per cent of Bangladesh was flooded for between a few days and several months. This caused more than a 1,000 deaths, damaged more than half a million homes and affected an estimated 30 million people. In India, monsoonal floods frequently inundate states such as Bihar. This was the case in 2008 when the Kosi River changed its course, affecting 4.7 million people. Cyclones coming up the Bay of Bengal have affected many coastal regions, including the megacities of Dhaka and Calcutta. In July 2005, floods brought Mumbai to a standstill for 48 hours, following a day of record rainfall.

It is a major reason for the increasing impoverishment and marginalisation of rural households and communities. This riverbank erosion is exacerbated by the intensity of floods created by melt water from glaciers, which are expected to increase as the global temperature rises. During the dry season these same populations face water and food insecurity.At particular risk from sea-level rise are the people living on the islands of the Sunder

bans in the Bay of Bengal. The decrease in flow of the Ganges River due to the construction of the Farakka Barrage in West Bengal (India) now means that seawater pushes up the delta, creating heavy inland flooding during tidal surges. This has destroyed rice fields and thus forced people to find alternate jobs in Bangladesh. While some employment has been created by the cultivation of shrimp, they are too expensive for local consumption and this has meant that rice must now be imported. This further marginalises the poor, and, with the decrease in employment, forces many men to migrate, leaving behind women, children and the elderly.

2

Physical Bases I: Geology, Relief and Drainage

SOUTH ASIA'S PHYSICAL LANDSCAPE

South Asia's Himalaya Mountains are the highest in the world, soaring to over 8,800 meters (29,000 feet). Yet, these are also some of the world's youngest mountains, reflecting a region that has experienced significant physical and cultural changes throughout its history. Here, we find one of the earliest and most widespread ancient civilizations, the hearth area for several of the world's great religions, and a region whose population will soon be the largest on Earth.

South Asia is a well-defined region in terms of its physical landscape. Formidable physical barriers separate the region from the rest of the Eurasian landmass. Much of the impressive physical geographic features of South Asia are the result of tectonic activity. Between 40 and 50 million years ago, the Indian Plate collided with the Eurasian plate. Both the Indian Plate and the Eurasian plate were comprised of fairly low density material, and so when the collision occurred, the two landmasses folded like an accordion creating the mountain ranges we see today. The Indian Plate is still moving towards the Eurasian plate today and over the next 10 million years, will move an additional 1,500 km (932 mi) into Asia.

This massive tectonic collision resulted in perhaps the most well-known physical feature in South Asia: Mount Everest. Everest, located in the Himalaya Mountain range on the border of Nepal and China, is the highest mountain in the world. Because the India Plate continues to collide with the Eurasian Plate, this mountain range is still tectonically active and is rising at a rate of 5 mm each year. Thus, if you're planning on scaling Mount Everest in ten years, be prepared to climb an extra two inches.

Although the Himalaya Mountains are well-known for having the highest peak, the Karakoram Mountain range, passing through Pakistan, India, China, and Afghanistan, has the highest concentration of peaks above 8,000 meters (26,000 feet). Its highest peak, K2, is the second-highest mountain in the world and far fewer people have successfully made it to the top compared to Everest. One in four people die while attempting to summit.

Another key physical feature of South Asia, the Deccan Plateau, was also formed from the region's tectonic activity. Around 65 million years ago, there was an enormous fissure in Earth's crust which led to a massive eruption of lava. The entire Indian peninsula was buried in several thousand feet of basalt, a type of dense, volcanic rock.

South Asia's rivers, including the Indus, Ganges, and Brahmaputra form a lowland region that was home to several ancient civilizations. Today, these rivers provide for the water needs of many of this region's people, irrigation for agricultural lands, and an abundance of fish. However, these rivers have had significant environmental concerns in recent years and have supported increasing numbers of people along their banks. Most of the area along the Ganges River, for example, has been converted into urban or agricultural land and the wild species like elephants and tigers that used to be present along the river are now gone. Pollution in the Ganges River has reached unprecedented levels as industrial waste and sewage is dumped untreated into the river despite the fact that people frequently use the water for bathing, washing, and cooking. It is estimated that around 80 percent of all illnesses in India result from water-borne diseases. The World Bank has loaned India over $1 billion to clean up the river, but experts believe that larger scale infrastructure improvements are needed to improve the region's water quality.

The most important climatic feature of South Asia is a dramatic weather cycle known as the monsoon. The monsoon refers to seasonal shifts in wind that result in changes in precipitation. From October to April, winds typically come from the northeast in South Asia creating dry conditions. Beginning in April, however, winds shift to the southwest, picking up moisture over the Arabian Sea, Indian Ocean, and Bay of Bengal.

Most of the rain during the monsoon season results from orographic precipitation, caused when physical barriers form air masses to climb where they then cool, condense, and form precipitation. India's Western Ghats, a mountain range on its western coast, for example, causes orographic precipitation on its windward side. The Himalaya Mountains similarly result in orographic precipitation. However, these impressive highland areas are so formidable that they cause a dry area on their leeward side, known as a rain shadow. On one side of the Himalayas are some of the wettest places on Earth with over 30 feet of rain each year. On the other side, the rain shadow from the mountains forms the arid Gobi Desert and Tibetan Plateau.

The monsoon rains, though extreme, provide significant benefits for South Asia's agriculture and economy. India gets more than 80 percent of its yearly rainfall from the monsoon and the rains are essential for both subsistence and commercial agriculture in the region. A good monsoon year will replenish the region's water supplies and increase crop yields, driving down food prices. Ample rainfall also contributes to the region's hydroelectricity potential. However, the torrential rains of the monsoon can also cause widespread flooding, destroying agricultural lands and transportation infrastructure, and can contribute to water-borne and insect-borne illnesses due to the significant amounts of standing water.

The monsoon is changing, though. Global changes in climate have made the monsoon harder to predict. In addition, rising numbers of automobiles across South Asia have increased air pollution, which can interfere with the mechanics of the monsoon. In the past, once the monsoon season starts, rains continue throughout the season. Recently, though, the monsoon rains have begun to stop and start throughout the rainy season. People in this

region are generally unprepared for an unpredictable or variable monsoon season and rely heavily on the rains for agriculture. Local leaders are pushing for more research to better understand the shifting monsoon rains and for increased education on water conservation and sustainable agricultural management.

GEOLOGIC HISTORY

Asia is not only Earth's largest continent but also its youngest and structurally most-complicated one. Although Asia's evolution began almost four billion years ago, more than half of the continent remains seismically active, and new continental material is currently being produced in the island arc systems that surround it to the east and southeast. In such places, new land is continuously emerging and is added to the bulk of the continent by episodic collisions of the island arcs with the mainland. Asia also contains the greatest mountain mass on Earth's surface: the Plateau of Tibet and the bordering mountains of the Himalayas, Karakoram Range, Hindu Kush, Pamirs, Kunlun Mountains, and Tien Shan. By virtue of its enormous size and relative youth, Asia contains many of the morphological extremes of Earth's land surface—such as its highest and lowest points, longest coastline, and largest area of continental shelf. Asia's immense mountain ranges, varied coastline, and vast continental plains and basins have had a profound effect on the course of human history. The fact that Asia produces vast quantities of fossil fuels—petroleum, natural gas, and coal—in addition to being a significant contributor to the global production of many minerals (e.g., about three-fifths of the world's tin) heavily underlines the importance of its geology for the welfare of the world's population.

General considerations

Tectonic framework

The morphology of Asia masks an extremely complex geologic history that predates the active deformations largely responsible for the existing landforms. Tectonic units (regions that once formed or now form part of a single tectonic plate and whose structures derive from the formation and motion of that plate) that are defined on the basis of active structures in Asia are not identical

to those defined on the basis of its fossil (i.e., now inactive) structures. It is therefore convenient to discuss the tectonic framework of Asia in terms of two separate maps, one showing its paleotectonic (i.e., older tectonic) units and the other displaying its neotectonic (new and presently active) units.

Mount Belukha

According to the theory of plate tectonics, forces within Earth propel sections of its crust on various courses, with the result that continents are formed and oceans are opened and closed. Oceans commonly open by rifting—by tearing a continent asunder—and close along subduction zones, which are inclined planes along which ocean floors sink beneath an adjacent tectonic plate and are assimilated into Earth's mantle. Ocean closure culminates in continental collision and may involve the accretion of vast tectonic collages, including small continental fragments, island arcs, large deposits of sediment, and occasional fragments of ocean-floor material. In defining the units to draw Asia's paleotectonic map, it is useful to outline such accreted objects and the lines, or sutures, along which they are joined.

Continuing convergence following collision may further disrupt an already assembled tectonic collage along new, secondary lines, especially by faulting. Postcollisional disruption also may reactivate some of the old tectonic lines (sutures). Those secondary structures dominate and define the neotectonic units of Asia. It should be mentioned, however, that most former continental collisions also have led to the generation of secondary structures that add to the structural diversity of the continent.

The paleotectonic units of Asia are divided into two first-order classes: continental nuclei and orogenic (mountain-building) zones. The continental nuclei consist of platforms that stabilized mostly in Precambrian time (between roughly 4 billion and 541 million years ago) and have been covered largely by little-disturbed sedimentary rocks; included in that designation are the Angaran (or East Siberian), Indian, and Arabian platforms. There are also several smaller platforms that were deformed to a greater extent than the larger units and are called paraplatforms; those include the North China (or Sino-Korean) and Yangtze paraplatforms, the

Kontum block (in Southeast Asia), and the North Tarim fragment (also called Serindia; in western China). The orogenic zones consist of large tectonic collages that were accreted around the continental nuclei. Recognized zones are the Altaids, the Tethysides (further subdivided into the Cimmerides and the Alpides), and the circum-Pacific belt. The Alpides and circum-Pacific belt are currently undergoing tectonic deformation—i.e., they are continuing to evolve—and so are the locations of earthquakes and volcanic eruptions.

The Precambrian continental nuclei were formed by essentially the same plate tectonic processes that constructed the later orogenic zones, but it is best to treat them separately for three reasons. First, the nuclei occupy only about one-fourth of the area of Asia, and less than one-third of that area (i.e., less than 10 percent of Asia's total) consists of exposed Precambrian rocks that enable geologists to study their development. Second, Precambrian rocks are extremely poor in fossils, which makes global or even regional correlations difficult. Finally, during most of Phanerozoic time (i.e., about the past 541 million years), the nuclei have remained stable and have acted as hosts around which the tectonic collages have accumulated in the Phanerozoic orogenic zones.

The paleotectonic evolution of Asia terminated some 40 to 50 million years ago as a result of the collision of the Indian subcontinent with Eurasia. Asia's subsequent neotectonic development has largely disrupted the continent's preexisting fabric. The first-order neotectonic units of Asia are Stable Asia, the Arabian and Indian cratons, the Alpide plate boundary zone (along which the Arabian and Indian platforms have collided with the Eurasian continental plate), and the island arcs and marginal basins.

Chronological summary

The oldest rocks in Asia are found in the continental nuclei. Rocks more than 3 billion years old are in the Precambrian outcrops of the Angaran and Indian platforms and in the North China paraplatform. They consist of primitive island-arc magmatic and sparse sedimentary rocks sandwiched between younger basaltic and ultrabasic rocks, exposed along what are called greenstone

belts. The basement of the Angaran platform was largely formed by about 1.5 billion years ago. The final consolidation of the Indian platform, however, lasted until about 600 million years ago and included various mountain-building episodes with peaks of activity between 2.4 and 2.3 billion years ago, at about 2 billion years ago, between 1.7 and 1.6 billion years ago, and between 1.1 billion and 600 million years ago. In the Arabian platform the formation of the present basement commenced by arc and microcontinent accretion some 900 million years ago and ended about 600 million years ago, although some of the accreted microcontinents had basements more than 2.5 billion years old and may be detached fragments of Africa.

In the North China paraplatform, Chinese geologists have identified a period of intense island-arc magmatism (a process by which molten rock, often formed by the melting of subducted oceanic crust, rises and solidifies to form igneous rock) between 3.5 and 3 billion years ago. Those arcs then coalesced into protonuclei by collisions until the end of the Archean Eon (2.5 billion years ago). Final consolidation of the North China paraplatform occurred approximately 1.7 billion years ago. The Yangtze paraplatform is younger, the oldest identified orogenic event being 2.5 billion years old. Its final consolidation took place some 800 million years ago. The Kontum block is poorly known. It contains Precambrian metamorphic rocks with minimum ages of about 2.3 billion years, although the oldest well-dated widespread thermal event falls into the middle Cambrian Period (about 500 million years ago) and indicates the time of its final consolidation. The North Tarim fragment is really a thin sliver caught up in younger orogenic belts. Its Precambrian history is not entirely dissimilar to that of the Yangtze paraplatform, although not all major breaks in their sedimentary and structural evolution or the details in their sedimentary successions correlate. The Tarim fragment was also stabilized some 800 million years ago.

While other Asian continental nuclei were completing their consolidation, orogenic deformation recommenced along the present southeast and southwest margins of the Angaran platform. That renewed activity marked the beginning of a protracted period of subduction, the development of vast sedimentary piles scraped

off sinking segments of ocean floor in subduction zones and accumulated in the form of subduction-accretion wedges at the leading edge of overriding plates, and subduction-related magmatism and numerous collisions in what today is known as Altaid Asia (named for the Altai Mountains). Orogenic deformation in the Altaids was essentially continuous from the late Proterozoic Eon (about 850 million years ago) into the early part of the Mesozoic Era (about 220 million years ago), in some regions—such as Mongolia and Siberia—lasting even to the end of the Jurassic Period (about 145 million years ago).

The construction of the Altaid collage was coeval with the late Paleozoic assembly of the Pangea (or Pangaea) supercontinent (between about 320 and 250 million years ago). The Altaids lay to the north of the Paleo-Tethys Ocean (also called Paleo-Tethys Sea), a giant triangular eastward-opening embayment of Pangea. A strip of continental material was torn away from the southern margin of the Paleo-Tethys and migrated northward, rotating around the western apex of the Tethyan triangle much like the action of a windshield wiper. That continental strip, called the Cimmerian continent, was joined during its northward journey by a collage of continental material that had gathered around the Yangtze paraplatform and the Kontum block, and, between about 210 and 180 million years ago, all of that material collided with Altaid Asia to create the Cimmeride orogenic belt.

While the Cimmerian continent was drifting northward, a new ocean, the Neo-Tethys, was opening behind it and north of the Gondwanaland supercontinent. The new ocean began closing some 155 million years ago, shortly after the beginning of the major disintegration of Gondwanaland. Two fragments of Gondwanaland, India and Arabia, collided with the rest of Asia during the Eocene (i.e., about 56 to 34 million years ago) and the Miocene (about 23 to 5.3 million years ago) epochs, respectively. The orogenic belts that arose from the destruction of the Neo-Tethys and the resultant continental collisions are called the Alpides and form the present Alpine-Himalayan mountain ranges. Both the Cimmerides and the Alpides resulted from the elimination of the Tethyan oceans, and collectively they are called the Tethysides.

Most of the island arcs fringing Asia to the east came into being by subduction of the Pacific Ocean floor and the opening

of marginal basins behind those arcs during the Cenozoic Era (the past 66 million years). That activity continues today and is the major source of tectonism (seismic and volcanic activity often resulting in uplift) in South and Southeast Asia. In the south and in the southwest, India and Arabia are continuing their northward march, moving at an average of about 2.4 and 1.6 inches (6 and 4 cm), respectively, per year. Those movements have caused the massive distortion of the southern two-thirds of Asia and produced the nearly continuous chain of mountain ranges between Turkey and Myanmar (Burma) that in places widen into high plateaus in Turkey, Iran, and the Tibet Autonomous Region of China. Within and north of those plateaus, geologically young mountains such as the Caucasus and the Tien Shan, large strike-slip faults such as the North Anatolian and the Altun (Altyn Tagh), and rift valley basins such as Lake Baikal—all of which are associated with seismic activity—bear witness to the widespread effects of the convergence of Arabia and India with Stable Asia, in which no notable active tectonism is seen.

STRATIGRAPHY AND STRUCTURE

The Precambrian

The recorded history of the Precambrian, which covers more than 80 percent of Earth's geologic history, is divided into two eons: the Archean, between roughly 4 and 2.5 billion years ago, and the Proterozoic, between 2.5 billion and 541 million years ago. In Asia rocks of Archean age are found in the Angaran and Indian platforms, in the North China and the Yangtze paraplatforms, and in smaller fragments caught up in younger orogenic belts such as the North Tarim fragment. In all those places especially, the early Archean evolution was dominated by intrusions of granodiorite that largely represented subduction-related magmatism and by the formation and deformation of greenstone belts that are probably relicts of old oceanic crust and mantle and immature (i.e., basalt-rich) island arcs. In India the more than 3-billion-year-old mafic-ultramafic associations of Kolar type with only subordinate sedimentary rocks represent the old greenstone belts that have either intrusive or tectonic contacts with Peninsular gneiss of similar age. The so-called Sargur schist belts within the Peninsular gneiss

may be the oldest suture zones in the Indian subcontinent. In the Angaran platform the older (i.e., more than 3 billion years) gneiss-granulite basement shows a progressive development in time from ophiolites (pieces of former ocean floors) and immature basaltic island-arc volcanic rocks to more silicic (silicon-rich) rocks such as andesites. In the North China paraplatform that early episode corresponds to the Qianxi Stage (3.5 to 3 billion years ago), in which mafic-ultramafic rocks with silicic sediments developed concurrently with granitic gneisses that were metamorphosed to a high degree.

After about 3 billion years ago the coalesced "granitic" island arcs, with intervening greenstone sutures that included more immature arc remnants, began forming the earliest continental nuclei: the Fuping (Fupingian) Stage in the North China paraplatform (3 to 2.5 billion years ago); the earlier Dharwar-type greenstone belts in south-central India; and the Olekma, Timpton-Dzheltula, Batomga, Cupura, and Borsala gneiss-granulite series, in addition to the Chara complex of gneisses and greenstones in the Angaran platform.

The present-day continental nuclei largely formed during the Proterozoic through the further agglomeration of the smaller Archean assemblages. The basement structure of the Angaran platform was formed for the most part between 2.1 and 1.8 billion years ago by repeated collisions along what have been dubbed the "second-generation greenstone belts." That interval also corresponds with the most intense granitic intrusive activity in the history of the platform. Some 1.45 billion years ago, shortly after the Angaran platform stabilized, it underwent a rifting event that created its southern and western continental margins and the large grabens (elongated downthrown fault blocks between two higher-standing blocks) that extend into the platform from those margins. The rifting may have separated Angara from the North American platform. Orogenic activity, which initiated the evolution of the Altaids, started along that margin about 850 million years ago and created the Baikal mountain belt.

In India the activity of the Dharwar greenstone belts lasted into the early Proterozoic, until about 2.3 billion years ago. Farther to the northwest the Aravalli and the Bijawar groups of sedimentary

rocks were deformed by the Satpura orogeny some 2 billion years ago. The Bijawar Group contains the only piece of evidence in Asia for an early Proterozoic ice age: the Gangan tillite (lithified glacial sediment), probable age about 1.8 billion years.

The Aravalli orogeny in the same place occurred between 1.7 and 1.6 billion years ago. In northeastern India, orogeny began some 1.7 billion years ago and culminated in a continental collision 950 million years ago in the present Singhbhum area. Widespread granitic magmatism in north-central India lasted until 600 million years ago, and it continued well into the Middle Ordovician Period (about 470 million years ago) in what later became the Himalayas.

DRAINAGE OF SOUTHEAST ASIA

Mainland Southeast Asia is drained by five major river systems, which from west to east are the Irrawaddy, Salween, Chao Phraya, Mekong, and Red rivers. The three largest systems—the Irrawaddy, Salween, and Mekong—have their origins in the Plateau of Tibet. These three rivers are somewhat atypical: their middle and upper drainage basins are not broad catchment areas with many small tributaries feeding larger ones but rather consist of a few streams confined to narrow, closely spaced valleys.

The Irrawaddy River flows through western Myanmar, draining the eastern slope of the country's western mountain chain and the western slope of the Shan Plateau. Although the river itself is shorter than either the Salween or the Mekong rivers, its lowland areas are more extensive. Most conspicuous is its delta, which is about 120 miles wide at its base and is expanding rapidly into the Andaman Sea.

The Salween River flows for several hundred miles through southern China before entering eastern Myanmar. In contrast to the Irrawaddy, the Salween is a highlands river throughout nearly all of its course. Its drainage basin is highly restricted with few tributaries, and its delta area is small. Even though the Salween's catchment area is limited and is sheltered from seasonal rains, its water volume fluctuates considerably from season to season.

The Mekong—one of the world's great river systems—is the longest river of mainland Southeast Asia and has the largest

drainage basin. After flowing for some 1,200 miles through southern China, the Mekong flows for nearly 1,500 more miles through Laos (where it also forms much of the western border of the country), Cambodia, and Vietnam. The Tonle Sap in Cambodia, the largest lake in Southeast Asia, drains into the vast Mekong delta. The area of the lake varies greatly with the precipitation cycle of the region.

The Chao Phraya River is the major river of Thailand and the shortest of the great rivers of the mainland. Rising in the northwestern highlands of Thailand, it drains the western portion of northern Thailand. The densely populated delta contains Bangkok, Thailand's capital and the largest city on the mainland. The Red River of northern Vietnam has the smallest drainage basin of the major rivers. The river follows a narrow valley through southern China and northwestern Vietnam before flowing into a relatively small lowland.

Soils

Southeast Asia, on balance, has a higher proportion of relatively fertile soils than most tropical regions, and soil erosion is less severe than elsewhere. Much of the region, however, is covered by tropical soils that generally are quite poor in nutrients.

Often the profusion of plant life is more related to heat and moisture than to soil quality, even though these climatic conditions intensify both chemical weathering and the rate of bacterial action that usually improve soil fertility.

Once the vegetation cover is removed, the supply of humus quickly disappears. In addition, the often heavy rainfall leaches the soils of their soluble nutrients, hastens erosion, and damages the soil texture. The leaching process in part results in laterites of reddish clay that contain hydroxides of iron and alumina.

Laterite soils are common in parts of Myanmar, Thailand, and Vietnam and also occur in the islands of the Sunda Shelf, notably Borneo. The most fertile soils occur in regions of volcanic activity, where the ejecta is chemically alkaline or neutral. Such soils are found in parts of Sumatra and much of Java in Indonesia. The alluvial soils of the river valleys also are highly fertile and are intensively cultivated.

Climate

All of Southeast Asia falls within the warm, humid tropics, and its climate generally can be characterized as monsoonal (i.e., marked by wet and dry periods). Changing seasons are more associated with rainfall than with temperature variations. There is, however, a high degree of climatic complexity within the region.

Temperatures

Regional temperatures at or near sea level remain fairly constant throughout the year, although monthly averages tend to vary more with increasing latitude. Thus, with the exception of northern Vietnam, annual average temperatures are close to 80 °F (27 °C). Increasing elevation acts to decrease average temperatures, and such locations as the Cameron Highlands in peninsular Malaysia and Baguio in the Philippines have become popular tourist destinations in part because of their relatively cooler climates. Proximity to the sea also tends to moderate temperatures.

Precipitation

Much of Southeast Asia receives more than 60 inches (1,500 millimetres) of rainfall annually, and many areas commonly receive double and even triple that amount. The rainfall pattern is distinctly affected by two prevailing air currents: the northeast (or dry) monsoon and the southwest (or wet) monsoon.

The northeast monsoon occurs roughly from November to March and brings relatively dry, cool air and little precipitation to the mainland. As the southwestward-flowing air passes over the warmer sea, it gradually warms and gathers moisture. Precipitation is especially heavy where the airstream is forced to rise over mountains or encounters a landmass. The east coast of peninsular Malaysia, the Philippines, and parts of eastern Indonesia receive the heaviest rains during this period.

The southwest monsoon prevails from May to September, when the air current reverses and the dominant flow is to the northeast. The mainland receives the bulk of its rainfall during this period. Over much of the southern Malay Peninsula and insular Southeast Asia there is little or no prolonged dry season. This is especially marked in much of the equatorial region and along the east coast of the Philippines.

While the dry and wet monsoons are important in explaining rainfall patterns, so too are such factors as relief, land and sea breezes, convectional overturning and cyclonic disturbances. These factors often are combined with monsoonal effects to produce highly variable rainfall patterns over relatively short distances. While many of the cyclonic disturbances produce only moderate rainfall, others mature into tropical storms—called cyclones in the Indian Ocean and typhoons in the Pacific—that bring heavy rains and destruction to the areas over which they pass. The Philippines are particularly affected by these storms.

Plant life

The seasonal nature and pattern of Southeast Asia's rainfall, as well as the region's physiography, have strongly affected the development of natural vegetation. The hot, humid climate and enormous variety of habitats have given rise to an abundance and diversity of vegetative forms unlike that in any other area of the world. Much of the natural vegetation has been modified by human action, although large areas of relatively untouched land still can be found.

The vegetation can be grouped into two broad categories: the tropical-evergreen forests of the equatorial lowlands and the open type of tropical-deciduous, or "monsoon," forests in areas of seasonal drought. The evergreen forests are characterized by multiple stories of vegetation, consisting of a variety of trees and plants. Although a large diversity of tree species is found in these forests, members of the Dipterocarpaceae family account for roughly half of the varieties. Deciduous forests are found in eastern Indonesia and those parts of the mainland where annual rainfall does not exceed 80 inches. Just as in the equatorial forest, a wide variety of species is normally the rule. Certain species, such as teak, have become highly valued commercially. Teak is found in parts of Indonesia, Myanmar, Thailand, and Laos.

DISASTER RELIEF AND RECOVERY

While many organizations whose primary focus was on emergency relief are gradually leaving, Plan has remained a steady presence in communities affected by the tsunami.

During the past year, we've moved away from emergency activities to longer-term recovery and rehabilitation programs.

Look at what we've accomplished so far:

In India, we have:

- Provided around 6,000 people with health care. Particular emphasis has been placed on immunization and antenatal/ postnatal care;
- Provided over 2,500 children with hygiene kits that include soap, toothbrush, toothpaste, etc;
- Provided families with 180 boats, 80 boat engines and 140 fish storage units;
- Completed the reclamation of 357 acres of land;
- Rehabilitated 60 ponds by removing saline water and applying organic manure for cultivation;
- Trained counselors, who have helped 2,100 children and adults deal with psychosocial issues;
- Provided counseling to more than 33,000 children who have called the Child Helpline;
- Set up 24 child care centers to support 2,400 children younger than 5;
- Provided 2,100 children between the ages of 5 and 15 with evening classes;
- Provided 550 children with educational scholarships;
- Equipped 44 child care centers with potable water and child-friendly toilets;
- Provided immediate relief items, such as food, clothing and medicine, in about 140 villages in Tamil Nadu and Andhra Pradesh in the emergency phase, covering 3,700 families;
- Built 865 temporary shelters and improved more than 1,000 temporary shelters;
- Conducted community consultations regarding the construction of about 800 permanent houses in Tamil Nadu and Pondicherry;
- Upgraded 41 tanks, 20 bore wells and 2 drinking water systems in affected communities;

- Provided affected communities with 12 sanitary units, 22 toilets, 4 bathrooms, 4 washing stones and 1 septic tank.

In Indonesia, we have:

- Distributed 2 million micronutrient packages to more than 50,000 families. This has reduced the impact of diarrhoeal diseases in displaced persons camps;
- Distributed equipment to village health posts;
- Attended basic health needs in 10 displaced persons camps;
- Supported school feeding for 2,250 children in 37 camps;
- Started reconstruction and/or repair of 7 schools;
- Provided 5 water tankers to local NGOs, serving 60 camps with 55,000 inhabitants;
- Installed 4 latrine units, 3 units of public toilets and bathing places, 2 wells and 15 hand pumps for 630 people;
- Cleaned and rehabilitated 31 existing wells for 600 people;
- Installed water and sanitation systems in 9 villages, benefiting more than 10,000 people;
- Distributed agricultural, fishing and sewing equipment to families;
- Provided training to carpenters through the Aceh Carpenter Association;
- Conducted a birth registration campaign. Some 5,000 children are expected to be registered by the end of December 2005;
- Established a child helpline with an effective referral system.

In Sri Lanka, we have:

- Provided medical supplies and water tankers during the emergency relief phase;
- Provided medicines and supplies to the Ministry of Health;
- Provided essential equipment to hospitals and health centers, including ECG machines, x-ray machines, scales and other vital equipment;
- Installed "Happy/Sad Letterboxes" in 64 schools in Hambantota. We are also providing training to counselors and teachers;

- Jointly sponsored a national drawing competition targeting tsunami-affected children;
- Launched a radio program in the southern region, providing free classes for students affected by the tsunami;
- Provided education materials to 75,000 children in a coastal district of the South;
- Provided 8,000 children with school uniforms and shoes;
- Provided 100 tanks for temporary shelters and house construction sites;
- Begun construction of the Yayawatta housing settlement after a long consultation with affected children and adults. This settlement will consist of 200 child-friendly houses;
- Worked with 150 families to rebuild their homes. To date, 112 families have started construction with assistance from Plan;
- Provided US$250,000 in loans and grants to Plan's microfinance partners to allow the deferment of old loans and the extension of new loans to women affected by the tsunami;
- And we're establishing a school-based psychosocial support system in 10,000 schools across the country in collaboration with the German aid agency GTZ, the National Institute of Education and the Ministry of Education.

In Thailand, we have:

- Started construction and/or repair of 4 preschools in Phang-Nga;
- Conducted a teacher training workshop on strategies to improve child psychosocial support for educators from 27 schools;
- Launched a mobile psychosocial support unit called Saidek Caravan that reaches more than 1,300 children in 14 schools;
- Launched a Youth Center at Ban Nam Khem that provides vocational training for youth affected by the tsunami;
- Planned vocational training courses for women and youth in both Phuket and Phang-Nga during the months of November and December.

DRAINAGE SYSTEM (GEOMORPHOLOGY)

In geomorphology, drainage systems, also known as river systems, are the patterns formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. Geomorphologists and hydrologists often view streams as part of drainage basins (and sub-basins). This is the topographic region from which a stream receives runoff, throughflow, and its saturated equivalent, groundwater flow. The number, size, and shape of the drainage basins varies and the larger and more detailed the topographic map, the more information is available.

Drainage patterns

Per the lie of channels, drainage systems can fall into one of several categories, known as drainage patterns. These depend on the topography and geology of the land.

All forms of transitions can occur between parallel, dendritic, and trellis patterns.

Accordant versus discordant drainage patterns

A drainage system is described as accordant if its pattern correlates to the structure and relief of the landscape over which it flows.

A discordant system or pattern does not correlate to the topography and geology of the area. Discordant drainage patterns are classified into two main types: *antecedent* and *superimposed*, while *ante position* drainage patterns combine the two. In *antecedent* drainage, a river's vertical incision ability matches that of land uplift due to tectonic forces. *Superimposed* drainage develops differently: initially, a drainage system develops on a surface composed of 'younger' rocks, but due to denudation activities this surface of younger rocks is removed and the river continues to flow over a seemingly new surface, but one in fact made up of rocks of old geological formation.

Dendritic drainage pattern

Dendritic drainage systems are not straight and are the most common form of the drainage system. In this, there are many sub-

tributaries (analogous to the twigs of a tree), which merge into tributaries of the main river (the branches and the trunk of the tree, respectively). They are seen to feed a river channel that matches and is strongly accordant to the overriding gradient of the land. Truly dendritic systems form in V-shaped valleys; as a result, the rock types must be quite obviously impervious and non-porous.

Parallel drainage pattern

A parallel drainage system occurs on a common slope down linear ranges (or of rivers between linear series of escarpments, parallel, elongate landforms like outcropping resistant rock bands), typically following natural faults or erosion (such as prevailing wind scars). The watercourses run swift and straight, with very few tributaries, and all flow in the same direction. This system forms on very long, uniform slopes, for instance, high rivers flowing southeast from the Aberdare Mountains in Kenya and many rivers of Myanmar.

This sometimes indicates a major fault that cuts across an area of steeply folded bedrock.

Trellis drainage pattern

The geometry of a trellis drainage system is similar to that of a common garden trellis. Along a strike valley, smaller tributaries feed into the steep slopes of mountainsides. These tributaries enter the main river about perpendicular, causing a trellis-like appearance of the system. They form where hard and soft formations exist on both banks of the main river, and are reflective of height, accentuated by erosion. Trellis drainage is characteristic of folded mountains, such as the Appalachian Mountains in North America and in the north part of Trinidad.

Rectangular drainage pattern

Rectangular drainage develops on rocks that are of approximately uniform resistance to erosion, but which have two directions of jointing at approximately right angles or 90 degrees. The joints are usually less resistant to erosion than the bulk rock so erosion tends to preferentially open the joints and streams eventually develop along the joints. The result is a stream system in which streams consist mainly of straight line segments with

right-angle bends and tributaries join larger streams at right angles. This pattern can be found with the Arun River in Nepal.

Radial drainage pattern

In a radial drainage system, the streams radiate outwards from a central high point. Volcanos usually have archetypal features on which this commonly develops are modest or hard domes pattern develops when streams flow in many general directions (meaning quite long-term)

In India, the Amarkantak range and Ramgarh crater are most archetypal; and Dogu'a Tembien in Ethiopia.

Centripetal drainage pattern

When the streams converge at a point, which is generally a depression or a basin they form centripetal or inland drainage pattern.

Deranged drainage pattern

A deranged drainage system is a drainage system in drainage basins where there is no coherent pattern to the rivers and lakes. It happens in areas where there has been much geological disruption.

The classic example is the Canadian Shield. During the last ice age, the topsoil was scraped off, leaving mostly bare rock. The melting of the glaciers left land with many irregularities of elevation and a great deal of water to collect in the low points, explaining the large number of lakes which are found in Canada. The drainage basins are young and are still sorting themselves out. Eventually the system will stabilize.

Annular drainage pattern

In an annular drainage pattern streams traces a tangential or greater concentric path along a belt of weak rock so, with others, a roughly traced out ring can be seen. It is best displayed by streams draining a maturely dissected structural dome or basin where erosion has exposed rimming sedimentary strata of greatly varying degrees of hardness, as in the Red Valley, which nearly encircles the domal structure of the Black Hills of South Dakota.

Angular drainage pattern

Angular drainage patterns form where bedrock joints and faults intersect at angles other than rectangular drainage patterns. Angles can be more or less than 90 degrees.

INTEGRATED DRAINAGE

An integrated drainage is a mature drainage system characteristic of arid climates. It is formed by coalescing of individual basins formerly separated by high ground, such as mountains or ridges. Headward erosion from a lower basin may breach the barrier, as may spilling over from a higher basin due to aggradation (accumulation of sediments in the basin). The effect of integration of a drainage system is to replace local higher base levels with a single lower base level. An example of an integrated drainage is the area drained by the Rio Grande River. The sedimentary basins forming the modern Rio Grande Valley were not integrated into a single river system draining into the Gulf of Mexico until relatively recent geologic time. Instead, the basins formed by the opening of the Rio Grande rift were initially bolsons, with no external drainage and a central playa. An axial river existed in the Espanola Basin as early as 13 million years ago, reaching the Santo Domingo Basin by 6.9 million years ago. However, at this time, the river drained into a playa in the southern Albuquerque Basin where it deposited the Popotosa Formation. The upper reach of this river corresponded to the modern Rio Chama, but by 5 million years ago, an ancestral Rio Grande draining the eastern San Juan Mountains had joined the ancestral Rio Chama.

The ancestral Rio Grande progressively integrated basins to the south, reaching the Palomas basin by 4.5 million years ago, the Mesilla basin by 3.1 million years, to Texas by 2.06 million years, and finally joining the Pecos River at 800,000 years to drain into the Gulf of Mexico. Volcanism in the Taos Plateau reduced drainage from the San Luis basin until a spillover event 440,000 years ago that drained Lake Alamosa and fully reintegrated the San Luis basin into the Rio Grande basin.

Integrated drainages were widespread in western North America in the Paleocene and Eocene, and there is evidence of integrated drainages on the surface of Mars.

3

Physical Bases II: Climate, Soil and Vegetation

The climate of South Asia can be divided into three basic kinds: tropical, dry, and temperate. The northeast is from tropical to subtropical (temperate). Moving west the moisture and elevation change, causing a steppe and a desert climate that is like the Middle East. There is also a part of steppe climate in the center of the lower peninsula. Two parts of the South Asia climate especially affect the people. One like the *monsoons*. These changing winds bring lots of the area's rain, so when they do not come early, the land becomes very dry. Hurricanes also happen every year and sometimes destroy many things. In the extreme north of India and Pakistan, the climate is affected by the mountains. There is a mild climate near the Indus river where farmers grow crops like rice and tea.

CLIMATE OF ASIA

Air masses and wind patterns

Continental climate

The enormous expanse of Asia and its abundance of mountain barriers and inland depressions have resulted in great differences between regions in solar radiation, atmospheric circulation, precipitation, and climate as a whole. A continental climate,

associated with large landmasses and characterized by an extreme annual range of temperature, prevails over a large part of Asia. Air reaching Asia from the Atlantic Ocean, after passing over Europe or Africa, has had time to be transformed into continental air—i.e., air that has often lost much of the moisture it absorbed over the ocean. As a result of the prevalent eastward movement of the air masses in the midlatitudes, as well as the isolating effect of the marginal mountain ranges, the influence of sea air from the Pacific Ocean extends only to the eastern margins of Asia. From the north, Arctic air has unimpeded access into the continent. In the south, tropical and equatorial air masses predominate, but their penetration to the centre of Asia is restricted by the ridges of the moutainous belt stretching from the highlands of West Asia through the Himalayas to the mountains of southern China and Southeast Asia; in the winter months (November through March), such penetration is further impeded by the density of the cold air masses over the interior.

The contrast between the strong heating of the continent in the summer months (May to September) and the chilling in winter produces sharp seasonal variations in atmospheric circulation and also enhances the role of local centres of atmospheric activity. Winter chilling of the Asian landmass develops a persistent high-pressure winter anticyclone over Siberia, Mongolia, and the Plateau of Tibet that is normally centred southwest of Lake Baikal. The area affected by the anticyclone is characterized by temperature inversions and by very cold, calm weather with little snowfall. The winter anticyclone is fed by subsiding upper air, by bursts of Arctic air flowing in from the north, and by the persistent westerly air drift that accompanies the gusty cyclonic low-pressure cells operating within the Northern Hemisphere cyclonic storm system. The high pressure propels cold, dry air eastward and southward out of the continent, affecting eastern and southern Asia during the winter. Only a few of the winter cyclonic lows moving eastward out of Europe carry clear across Asia, but they do bring more frequent changes in weather in western Siberia than in central Siberia. The zone of lowest temperature—a so-called cold pole—is found in the northeast, near Verkhoyansk and Oymyakon, where temperatures as low as “90 °F (“68 °C) and “96 °F (“71 °C), respectively, have been recorded.

The outward drift of winter air creates a sharp temperature anomaly in eastern and northeastern Asia, where the climate is colder than the characteristic global average for each given latitude. On the East Asian islands, the effect of the winter continental monsoon is tempered by the surrounding seas. As the air masses pass over the seas, they become warmed and saturated with moisture, which then falls as either snow or rain on the northwestern slopes of the island arcs. Occasionally, however, strong bursts of cold air carry cold spells as far south as Hong Kong and Manila.

The polar front

Cyclonic storms form and move eastward through the zone where the temperate and tropical air masses are in contact, called the polar front, which shifts southward in winter. The winter rainy season in the southern parts of the West Asian highlands, which is characteristic of the Mediterranean climate, is associated with that southward movement of the polar front. In northern areas of West and Middle Asia, the effect of cyclonic action is particularly strong in the spring, when the polar front moves north and causes the maximum in annual precipitation to occur then.

During the northern winter, South and Southeast Asia are affected by northeasterly winds that blow from high-pressure areas of the North Pacific Ocean to the equatorial low-pressure zone. Those winds are analogous to the trade winds and are known in South Asia as the northeast (or winter) monsoon. The weather is dry and moderately warm. Rainfall occurs only on the windward side of maritime regions (e.g., Tamil Nadu state in southeastern India and southern Vietnam). Some of the cyclonic storms that move eastward through the Mediterranean Basin during the winter are deflected south of the Plateau of Tibet, crossing northern India and southwestern China. Such storms do not often bring winter rain, but they create short periods of cloudy, cool, or gusty weather and are accompanied by snow in the higher mountain ranges.

In summer the polar front shifts northward, causing cyclonic rains in the mountains of Siberia. In West, Middle, and Central Asia, a hot, dry, dusty, continental tropical wind blows at that time. Over the basin of the Indus River, the heating creates a low-

pressure area. Known as the South Asian (or Iranian) low, it appears in April and is fully developed from June to August. The onset of monsoon in India and mainland Southeast Asia is related to changes in the circulation pattern that occur by June—specifically, the disintegration of the southern jet stream and the formation of low pressure over southern Asia. The monsoon air masses flow into that monsoonal low-pressure zone from a cell of high pressure just off the eastern coast of southern Africa. Because of the Coriolis force (the force caused by the Earth's rotation), winds south of the Equator change direction from southeast to southwest in the Arabian Sea and the Bay of Bengal. The southwest monsoon bursts upon the Malabar Coast of southwestern India in early June and gradually extends northward over most of the Indian subcontinent and mainland Southeast Asia. It brings considerable rainfall, which in most of those areas accounts for 80 to 90 percent of the total annual precipitation.

In eastern Asia the Pacific Ocean polar front creates atmospheric disturbances during the summer. From a summer high-pressure centre over the western Pacific, the warm and moist summer monsoon blows from the southeast toward the continent. To the south of latitude 38° N, where the warm Kuroshio (Japan Current) approaches the coast of Japan, the summer monsoon brings protracted rains and high humidity; together with high temperatures, that creates a hothouse atmosphere. Becoming chilled as it passes over cold ocean currents to the north, that air brings fogs and drizzling rains to northeastern Asia.

Monsoons and typhoons

Summer in China is a time of variable air movement out of the western Pacific. If that drift is strong and low pressure over the continental interior is intense, the summer monsoon may carry moisture well into Mongolia. If neither the drift nor the continental low is strong, the China summer monsoon may fail, falter over eastern China, or cause irregular weather patterns that threaten the country with crop failure. The monsoon there is less dramatic than in other areas, accounting for 50 to 60 percent of China's annual rainfall.

Tropical cyclones—called typhoons in the Pacific Ocean—may occur in coastal and insular South, Southeast, and East Asia

throughout the year but are most severe during the late summer and early autumn. Those storms are accompanied by strong winds and torrential rains so heavy that the maximum precipitation from the typhoons locally may exceed the total amounts received during the normal summer monsoons.

In winter continental tropical air prevails in tropical Asia; in summer it is replaced by equatorial ocean air. The winter season's dry and warm winds, directed offshore toward the equatorial low-pressure axis, are analogous to trade winds but simultaneously act as the South Asian continental monsoon. The dry spring that follows changes abruptly and dramatically into the rainy summer with the onset of the monsoon. The summer monsoon brings enormous amounts of rain (up to about 25 inches [635 mm] in a month). Over the areas of Asia closest to the Equator—southern Sri Lanka, Malaysia, and the Greater Sunda Islands—equatorial air prevails continuously, accompanied by even temperatures and abundant rainfall in all seasons. The Lesser Sunda Islands have a tropical monsoon climate; their wet and dry seasons are regulated by the calendar rhythm of the Southern Hemisphere, which is characterized by a wet summer from November to February and a dry winter from June to October.

The influence of topography

Differences between the climatic conditions of the various regions of Asia are determined to a considerable degree by topography. Different elevation-based climatic zones are most clearly defined on the southern slopes of the Himalayas, where they vary from the tropical climates of the foothills, at the lowest levels, to the extreme Arctic-like conditions of the peaks, at the highest elevations. The degree of exposure also plays a large role. The sunny southern slopes differ from the shady northern ones, and windward slopes exposed to moist ocean winds differ from leeward slopes, which, lying in the wind (and rain) shadow, are necessarily drier. The barrier effect is most pronounced in the zone of monsoon circulation (i.e., East, Southeast, and South Asia), where rain-bearing winds have a constant direction. In addition to the physical isolation of the leeward slopes from the moisture-laden winds, those slopes also experience the foehn effect, in which a strong wind traverses a mountain range and is deflected

downward as a warm, dry, gusty, erratic wind. Contrasts of climate resulting from exposure are manifested clearly in the Himalayas, the Elburz Mountains, Japan, Taiwan, the Philippines, the Tien Shan range, the region to the east of Lake Baikal (Transbaikalia), and many other places.

The isolating barrier effect of the relief on the climate is demonstrated most clearly in the West Asian highlands and in Central Asia. In those regions the surrounding mountains isolate the tablelands of the interior from moisture-laden winds. The massiveness of the interior highlands is also a significant factor; it gives rise to local anticyclones during the cold months of the year.

Temperature

The average January temperature over a considerable part of Siberia is below "4 °F ("20 °C), and in the region around Verkhoyansk it reaches "58 °F ("50 °C). Near the coast Pacific Ocean air moderates the average temperature to from 23 to 5 °F ("5 to "15 °C). The January isotherm (a line connecting points of equal temperature) of 32 °F (0 °C) extends eastward from the Anatolian and Iranian highlands; skirts the southern edge of the Pamirs, the Karakoram Range, and the Himalayas; and runs northeastward through China to south of the Shandong Peninsula and through the southern Korean peninsula and central Honshu. An isotherm of 68 °F (20 °C) is traced along the Tropic of Cancer and one of 77 °F (25 °C) farther south.

In July the maximum temperatures are found in the lowlands of Mesopotamia and the Arabian Peninsula and in the Thar (Great Indian) and Takla Makan deserts. The 68 °F (20 °C) isotherm moves as far as latitudes 55° to 60° N, but, in the eastern Gobi and near the cool Pacific Ocean, it bends to the south. Along the far northeastern coast of Asia, the average temperature in July is below 50 °F (10 °C), which is typical for a tundra climate. The greatest amplitude in annual temperature range on Earth occurs near the "cold pole," which has remarkably warm summers; the annual range may exceed 175 °F (97 °C).

Precipitation

Annual rainfall in the equatorial belt is approximately 80

inches (2,000 mm); it is 80 to 120 inches (2,000 to 3,000 mm) and more (300 to 500 inches [7,600 to 12,700 mm] in places) on windward maritime slopes in South, Southeast, and East Asia. In Cherrapunji in northeastern India, some 900 inches (22,900 mm) of rain fell in seven months in 1891. Precipitation averages less than 40 inches (1,000 mm) annually on tropical lee slopes. In the subtropical and temperate monsoon climates there is adequate rainfall, amounting to about 24 to 80 inches (600 to 2,000 mm) annually. Annual precipitation is less than 10 inches (250 mm) in northeastern Siberia and averages 6 to 8 inches (150 to 200 mm) but may be less than 4 inches (100 mm) in some places in the deserts of West, Middle, and Central Asia.

SOUTH AND SOUTHEAST ASIA

The wettest parts of peninsular India (such as the Western Ghats) and of Southeast Asia have magnificent tropical forests noteworthy for the variety of their plant life. A significant feature of South Asian vegetation is the family Dipterocarpaceae (yielding aromatic oils and resins), which is represented there by more than 500 species. In parts of peninsular India and Southeast Asia that have a seasonal monsoon climate (with four to eight dry months per year), moist- and dry-deciduous forests thrive. Many of the tree species, such as teak, sal, and sandalwood, are highly valuable and are heavily exploited. In areas with a prolonged dry season and less precipitation (e.g., northwestern India, the interior of the Deccan plateau, and the "dry zone" of Myanmar [Burma]), savanna woodland and thorny thickets of acacias and euphorbias are the predominant natural vegetation. In all of the major climate zones of South and Southeast Asia, and particularly on the alluvial plains, much of the natural vegetation has been cleared to make way for agriculture.

Mangrove swamps thrive in the sheltered muddy coasts and deltas. Their outermost edges are represented by species of *Rhizophora* (red mangrove), followed by those of *Bruguiera* and *Avicennia* (white mangrove). The bogs on the landward edges of those swamps abound with the semiaquatic nipa palm.

Primeval evergreen rainforest remains in a few parts of South and Southeast Asia. Secondary forest covers a much larger area. The once universally dense forest has given way to parklike forest

and wooded savanna as a result of intensive grazing, tree harvesting, and shifting (slash-and-burn) agricultural practices. Extensive fires in such areas have produced a herbaceous landscape, as in the cogonales (areas of coarse tall grasses, used for thatching) of the Philippines.

Hevea brasiliensis, the rubber tree introduced into tropical Asia from South America in the 1870s, is particularly important in plantations in Malaysia and Indonesia.

In the higher mountains of Southeast Asia, the cooler humid-tropical climate gives rise to deciduous and coniferous temperate forest at elevations of between about 4,250 and 10,000 feet (1,300 and 3,000 metres). Above that level low forests of plants, mostly shrubs of the heath family, are often found. Diverse types of trees grow in the mountain forests of the region. The Rakhine (Arakan) Mountains of Myanmar, for example, are covered with a thick mantle of little bamboos. In the eastern Himalayas sal is intermingled with *Castanopsis* (a small genus of nut-bearing trees) and pines. Above those are found forests of shrubs and trees of the laurel family and, higher still, oaks and conifers; between about 10,000 and 13,000 feet (3,000 and 4,000 metres), forests of firs occur. The central Himalayas present strikingly beautiful landscapes in the following upward succession: dry sal forest; pine forest; cedars, spruces, pines, and oaks; firs, birches, and tall rhododendrons; rhododendron bushes and junipers above 13,000 feet (4,000 metres); and perpetual snows above 16,000 feet (4,900 metres).

South and West Asia

In West Asia naturally wild vegetation no longer occurs in clearly defined zones but is dispersed in small areas. The region is predominantly arid; desertlike depressions such as the Kyzylkum Desert of Uzbekistan and Kazakhstan, the Karakum Desert of Turkmenistan, and the Rub al-Khali (Empty Quarter) of the Arabian Peninsula contrast with the moist, forested mountains that lie between them. Three climatic zones, however, characterize West Asia: a continental climate in the northern regions; a dry zone, except where northerly winds bring moisture to the mountains, to the south; and a Mediterranean climate along the western edges.

A few examples of the variety of vegetation associated with those climatic zones may be cited. In the Karakum Desert grows a strange xerophytic tree, the saxaul, which is oddly shaped, gnarled, and leafless; it is widely used for firewood, and its young sprouts make excellent fodder for camels. Between the galleries of saxauls the desert is interspersed at wide intervals with bushes and tufts of grass. A fringe of steppe covers the area between the Fertile Crescent (which sweeps in an arc from the Tigris-Euphrates valley to the Mediterranean) and the north and west of the Syrian Desert. With more than 2,000 species of plants—more than in the whole of the Sahara—the borders of the Syrian Desert are noteworthy for their floral variety. The moist northern slopes of the Pontic Mountains in northern Turkey are covered by magnificent forests of beeches and conifers, with an undergrowth of tall cherry laurels, hollies, and creepers. That type of forest is also found in Georgia and on the northern slopes of the Elburz Mountains in Iran. Along the Mediterranean border of Asia, the natural vegetation is similar to that in other parts of the Mediterranean region: holm oak (an evergreen oak), Aleppo pine (used in shipbuilding), cistus, mastic tree (which yields mastic, an aromatic resin), and other species are found in landscapes of thick underbrush and open scrubland. Extensive forests, with such species as the cedar of Lebanon, once grew in that region, but logging and heavy grazing by livestock have reduced many once-forested areas to grassland and scrubland.

VEGETATION AND SOCIETY

Vegetation in traditional civilization

Asia's indigenous vegetation has provided many of the world's food crops—including most of the cereal grains, oilseeds, fruits, and vegetables—and its lands provided one of the great cradles of agriculture. Three primary centres for the domestication of those plants have been postulated. One was in the southwest, consisting of sites in the Levant and northern Syria, southeastern Anatolia, Transcaucasia, and the Zagros Mountains. Wild strains of wheat, barley, certain legumes, cherry and peach trees, and grapevines were domesticated in those regions. The second centre was in the south and east (northeastern India, peninsular Southeast

Asia, the Sunda Islands of Indonesia, and southern China), where rice, root crops such as taro and yams, and fruit trees such as bananas and mangoes were domesticated. The third centre was in northern China and adjacent regions, where foxtail millet, soybeans, and hemp were first cultivated.

Asian plant life also has provided building materials, such as wood, bamboo, and thatch; ramie and flax for clothing and hemp for rope and sacks; bamboo, widely used in the making of utensils; and the bark of the paper mulberry, used in the manufacture of bark cloth and paper. In addition, silkworms are fed mulberry leaves; lacquer is made from the lacquer tree (*Rhus vernicifera*); and a multitude of other items are obtained from plants, including many drugs and pharmaceuticals.

Human impact on natural landscapes

Agriculture (both rain-fed and irrigated), livestock grazing, and forestry have transformed Asian ecosystems. Three areas have undergone the greatest modification by agriculture: the broad band of predominantly wheat, corn (maize), and barley cultivation across southern Siberia and northern Kazakhstan; a large belt of wheat, corn, millet, and soybean cultivation across northern China; and the monsoonal zone of rice cultivation that stretches from India through Southeast Asia and South China to the Korean peninsula and Japan. Agricultural landscapes predominate in those regions, and natural vegetation is confined to rugged terrain. The impact of human activity in the arid regions is intensive in the irrigated areas of Mesopotamia, Middle Asia, the Indus River valley, and scattered oases. Pastoral activities have had a major impact on the vast belt of Asian steppes and deserts from the Arabian Peninsula to the Gobi and on the scrublands and former woodlands of the Asian Mediterranean region.

Areas with some of the least-disturbed ecosystems occur in northern and eastern Siberia, the Plateau of Tibet, and the mountain ranges of Central Asia. By contrast, areas exhibiting some of the most drastic changes to natural conditions include the eastern margins of the Thar (Great Indian) Desert in South Asia, Inner Mongolia and the Ordos region in China—all of which have been subject to intensive desertification from livestock overgrazing—and the Aral Sea basin in Middle Asia. Regarding the latter, large-

scale irrigation for cotton cultivation reduced the flow of the Amu Darya and Syr Darya, which feed the sea, and thus severely reduced its area; a toxic mixture of salts and pesticide residue from the dried seafloor has been spread by dust storms throughout the region.

ASSESSING THE COSTS OF CLIMATE CHANGE AND ADAPTATION IN SOUTH ASIA

With a population of 1.43 billion people, one-third of whom live in poverty, the South Asia developing members of ADB face the challenge of achieving and sustaining rapid economic growth to reduce poverty and attain other Millennium Development Goals in an era of accentuated risks posed by global climate change. Economic losses in key sectors, such as agriculture, energy, transport, health, water, coastal and marine, and tourism, are expected to be significant, rendering growth targets harder to achieve.

Highlights

According to the report's findings the total climate change cost in South Asia will increase over time and will be prohibitively high in the long term. Without global deviation from a fossil-fuel-intensive path, South Asia could lose an equivalent 1.8% of its annual gross domestic product (GDP) by 2050, which will progressively increase to 8.8% by 2100. The model suggests that the Maldives will be hardest hit in GDP loss, while Bangladesh, Bhutan, India, Nepal, and Sri Lanka are projected to face 2.0%, 1.4%, 1.8%, 2.2%, and 1.2%, respectively, loss of annual GDP by 2050.

However, should the global community take actions along the Copenhagen–Cancun agreements to keep the global mean temperature rise below or within 2 degrees Centigrade, the region would only lose an average of 1.3% of GDP by 2050 and roughly 2.5% by 2100. Impacts on vulnerable sectors include the following:

Agriculture

Higher temperatures eventually reduce yields of desirable crops while encouraging weed and pest proliferation. Changes in precipitation pattern (timing and amount) increase the likelihood

of short-run crop failures and long-run production declines, posing a serious threat to food security. Although there will be gain in some crops in some regions, the overall impacts of climate change on agriculture are expected to be negative and need to be much better understood.

Energy

A rise in average warming will increase energy requirements for space cooling (but reduce energy needed for warming), while increasing energy demand for irrigation. On the supply side, there is a direct influence on hydropower and thermal power generation through availability of water and the temperature of cooling water, respectively. Increases in intensity and frequency of extreme events like storms and sea level rise may cause more electrical system failures.

Forest and other ecosystems

Climate change will affect forest carbon pools in some countries of the region.

Health

The modeling results suggest that the mortality rate for the region caused by dengue, malaria, and diarrhea would increase over time as a consequence of climate change. Morbidity and deaths from such diseases could increase in the future under all scenarios.

Water

Although the monsoon-dominated annual precipitation cycle is expected to remain unchanged over South Asia, future decades are predicted to have drier and warmer winter months with reduced snow cover, while the summer/monsoon months are predicted to become wetter and warmer. The seasonal pattern of flows over the year could become more erratic, as rainfall is immediately converted to runoff instead of being stored as ice.

Adaptation options, policies and strategies

The region's adaptation response need not be confined to symptomatic treatment of threats to traditional patterns of economic

activity. More efficient regional economic diversification can create entirely new patterns and supporting infrastructure to take their place. In other words, policy makers need to take early action to adapt to climate risks, and this action needs to be informed by rigorous and timely evidence.

The South Asia developing member countries have by now developed their adaptation strategy. In some countries, such as India, state and subnational action plans have also been developed, allowing for integrating climate change adaption options in local project and facilities development. Building resilience to the impacts of climate change requires identifying the risks and vulnerabilities of sector and area development projects and programs, followed by developing the options for adaptation and mitigation measures that are socially, environmentally, and economically sound.

CLIMATE CHANGE IN SOUTH ASIA

Climate change in South Asia is having significant impacts already which are expected to intensify as global temperatures rise due to climate change. The South Asia region consists of the eight countries Afghanistan, Pakistan, India, Nepal, Bhutan, Bangladesh, the Maldives and Sri Lanka. In the 2017 edition of Germanwatch's *Climate Risk Index*, Bangladesh and Pakistan ranked sixth and seventh respectively as the countries most affected by climate change in the period from 1996 to 2015, while India ranked fourth among the list of countries most affected by climate change in 2015. South Asia is one of the most vulnerable regions globally to a number of direct and indirect effects of climate change, including sea level rise, cyclonic activity, and changes in ambient temperature and precipitation patterns. Ongoing sea level rise has already submerged several low-lying islands in the Sundarbans region, displacing thousands of people.

Among the countries of South Asia, Bangladesh is likely to be the worst affected by climate change. This is owing to a combination of geographical factors, such as its flat, low-lying, and delta-exposed topography, and socio-economic factors, including its high population density, levels of poverty, and dependence on agriculture. Its sea level, temperature, and evaporation are increasing, and the changes in precipitation and cross-boundary

river flows are already beginning to cause drainage congestion. There is a reduction in freshwater availability, disturbance of morphological processes, and a higher intensity of flooding.

Greenhouse gas emissions

Bangladesh only contributes 0.21% of the world's emissions yet it has 2.11% of the world's population. In contrast, the United States makes up about 4.25 percent of the world's population, yet they produce approximately 15 percent of the pollution that causes global warming.

According to data from 2020, China, the United States, India, and Russia are the world's biggest emitters of CO2.

Impacts on the natural environment

Temperature and weather changes

Regarding local temperature rises, the IPCC figure shows that mean annual value of temperature rise by the end of the century in South Asia is 3.3 °C with the min-max range as 2.7 – 4.7 °C. The mean value for Tibet would be higher with mean increase of 3.8 °C and min-max figures of 2.6 and 6.1 °C respectively, which implies harsher warming conditions for the Himalayan watersheds.

Extreme weather events

Increased landslides and flooding are projected to have an impact upon states such as Assam. Ecological disasters, such as a 1998 coral bleaching event that killed off more than 70% of corals in the reef ecosystems off Lakshadweep and the Andamans, and was brought on by elevated ocean temperatures tied to global warming, are also projected to become increasingly common.

Sea level rise

The global average sea level rose by 3.1 mm per year from 1993 to 2003. More recent analysis of a number of semi empirical models predict a sea level rise of about 1 metre by the year 2100. Ongoing sea level rises have already submerged several low-lying islands in the Sundarbans, displacing thousands of people. Temperature rises on the Tibetan Plateau are causing Himalayan glaciers to retreat. It has been predicted that the historical city of

Thatta and Badin, in Sindh, Pakistan would have been swallowed by the sea by 2025, as the sea is already encroaching 80 acres of land here, every day.

Some territories in India were already evacuated due to increase in tidal flooding. Large part of some Indian cities will be below tide-level by the year 2030: Mumbai, Kolkata, Cuttack, Kochi and more. Navi Mumbai will be below this level almost entirely.

In October 2019, a study was published in the Nature Communications journal. The journal claims that the number of people who will be impacted from sea level rise during 21st century is 3 times higher than the previous expected number. By the year 2050, 150 million will be under the water line during high tide and 300 million will live in zones with flooding every year. By the year 2100, those numbers differ sharply depending on the emission scenario. In a low emission scenario, 140 million will be under water during high tide and 280 million will have flooding each year. In high emission scenario, the numbers reach up to 540 million and 640 million, respectively. 70% of these people will live in 8 countries in Asia: China, Bangladesh, India, Indonesia, Thailand, Vietnam, Japan, and the Philippines. Large parts of Ho Chi Minh City, Mumbai, Shanghai, Bangkok and Basra could be inundated.

Population that will live in a zone of annual flooding by the year 2050 in millions, in 6 countries in Asia, according to old and new estimates:

Country	Old estimate	New estimate
China	29	93
Bangladesh	5	42
India	5	36
Vietnam	9	31
Indonesia	5	23
Thailand	1	12

Impacts on people

Economic impacts

India has the world's highest social cost of carbon. The Indira Gandhi Institute of Development Research has reported that, if the

predictions relating to global warming made by the Intergovernmental Panel on Climate Change come to fruition, climate-related factors could cause India's GDP to decline by up to 9%; contributing to this would be shifting growing seasons for major crops such as rice, production of which could fall by 40%. Around seven million people are projected to be displaced due to, among other factors, submersion of parts of Mumbai and Chennai, if global temperatures were to rise by a mere 2 °C (3.6 °F).

If severe climate changes occur, Bangladesh will lose land along the coast line. This will be highly damaging to Bangladeshis especially because about 50% population of Bangladeshis are employed in the agriculture sector, with rice as the largest production. If no further steps are taken to improve the current conditions global warming will affect the economy severely worsening the present issues further. The climate change would increase expenditure towards health care, cool drinks, alcoholic beverages, air conditioners, ice cream, cosmetics, agricultural chemicals, and other products.

Agriculture

Climate Change in India and Pakistan will have a disproportionate impact on the more than 400 million that make up India's poor. This is because so many depend on natural resources for their food, shelter and income. More than 56% of people in India work in agriculture, while in Pakistan 43! of its population work in agriculture while many others earn their living in coastal areas.

Health impacts

Heat waves

Heat waves' frequency and power are increasing in India because of climate change. The number of heat wave days has increased — not just day temperature, night temperatures increased also. 2018 was the country's sixth hottest year on record, and 11 of its 15 warmest years have occurred since 2004. The capital New Delhi broke its all-time record with a high of 48 degrees Celsius. The government is being advised by the Indian Institute of Tropical

Meteorology in predicting and mitigating heat waves. The government of Andhra Pradesh, for instance, is creating a Heat Wave Action Plan.

Impacts on migration

Villagers in India's North Eastern state of Meghalaya are also concerned that rising sea levels will submerge neighboring low-lying Bangladesh, resulting in an influx of refugees into Meghalaya which has few resources to handle such a situation.

MITIGATION AND ADAPTATION

There are many concrete steps which can be taken to address the threat of climate change. Incentives can be provided for electric vehicles or public transport and this curb the impact of the transportation sector. However, though these suggestions have been made, there is no political will to carry them out. Households can be given electricity and slowly phasing out LPG (the current trend is to increase the usage of the latter). Rainwater can be harvested and the rivers could be restored to their original flow so that they can bring back the wetlands and the natural ways of silt, nutrient and wildlife flow. All of these use technologies and can be implemented by the 11-year period the IPCC has stipulated before which any change must be made if we are to evade the adverse effects of climate change. So far, though the initiatives by the Delhi Metro to switch to solar power- or similar efforts by Kochi airport- are a step in the right direction, such moves are few and far between. These models should be taken up by other agents as well. The latest accord, the 2015 Paris Agreement, takes a different approach. The 197 signatory countries have promised to limit global temperature increase to just 1.5 °C over pre-industrialization levels, but each country has set its own targets. India, for instance, has promised to cut its emissions intensity (emissions per unit of GDP) by 33-35% by 2030 compared to 2005 levels (Chart 1a/ 1b).

Adaptation

The Asia-Pacific Climate Change Adaption Information Platform (AP-PLAT) was launched in 2019. It aims to provide Asia and Pacific countries with data on climate change and convert it to adaptation and resilience measures.

Climate change by South Asian country

Bangladesh

Climate change in Bangladesh is a critical issue as the country is one of the most vulnerable to the effects of climate change. In the 2020 edition of Germanwatch's *Climate Risk Index*, it ranked seventh in the list of countries most affected by climate calamities during the period 1999–2018. Bangladesh's vulnerability to climate change impacts is due to a combination of geographical factors, such as its flat, low-lying, and delta-exposed topography, and socio-economic factors, including its high population density, levels of poverty, and dependence on agriculture.

India

Climate change in India is having profound effects on India, which is ranked fourth among the list of countries most affected by climate change in the year 2015. India emits about 3 gigatonnes (Gt) CO_{2eq} of greenhouse gases each year; about two and a half tons per person, which is less than the world average. The country emits 7% of global emissions, despite having 17% of the world population. Temperature rises on the Tibetan Plateau are causing Himalayan glaciers to retreat, threatening the flow rate of the Ganges, Brahmaputra, Yamuna and other major rivers. A 2007 World Wide Fund for Nature (WWF) report states that the Indus River may run dry for the same reason. Heat waves' frequency and power are increasing in India because of climate change. Severe landslides and floods are projected to become increasingly common in such states as Assam. The Indira Gandhi Institute of Development Research has reported that, if the predictions relating to global warming made by the Intergovernmental Panel on Climate Change come to fruition, climate-related factors could cause India's GDP to decline by up to 9%. Contributing to this there would be shifting growing seasons for major crops such as rice, production of which could fall by 40%.

Nepal

Climate change in Nepal is a major problem for Nepal as it is one of the most vulnerable countries to the effects of climate change. Globally, Nepal is ranked fourth, in terms of vulnerability

to climate change. Floods spread across the foothills of the Himalayas and bring landslides, leaving tens of thousands of houses and vast areas of farmland and roads destroyed. In the 2020 edition of Germanwatch's Climate Risk Index, it was judged to be the ninth hardest-hit nation by climate calamities during the period 1999 to 2018. Nepal is a least developed country, with 28.6 percent of the population living in multidimensional poverty. Analysis of trends from 1971 to 2014 by the Department of Hydrology and Meteorology (DHM) shows that the average annual maximum temperature has been increasing by 0.056 °C per year. Precipitation extremes are found to be increasing. A national-level survey on the perception-based survey on climate change reported that locals accurately perceived the shifts in temperature but their perceptions of precipitation change did not converge with the instrumental records. Data reveals that more than 80 percent of property loss due to disasters is attributable to climate hazards, particularly water-related events such as floods, landslides and glacial lake outburst floods (GLOFs).

Pakistan

Climate change in Pakistan is expected to cause wide-ranging effects on the environment and people in Pakistan. As a result of ongoing climate change, the climate of Pakistan has become increasingly volatile over the past several decades; this trend is expected to continue into the future. In addition to increased heat, drought and extreme weather conditions in some parts of the country, the melting of glaciers in the Himalayas threatens many of the most important rivers of Pakistan. Between 1999 and 2018, Pakistan was ranked the 5th worst affected country in terms of extreme climate caused by climate change.

Sri Lanka

Climate change in Sri Lanka is an important issue, and its effects threaten to impact both human and natural systems in Sri Lanka. Roughly 50 percent of its 22 million citizens live in low-lying coastal areas in the west, south, and south-west of the island, and are at risk of future sea level rise. Climate change also threatens the island's biodiversity, including its marine ecosystem and coastal coral reef environments. Sea-level rise due to climate change has

the potential to affect the overall abundance of endemic species. Sri Lanka's coastal regions, such as the Northern Province and the Northern Western Province, are considered major hotspots and extremely vulnerable to climate change. These maritime provinces are the most densely populated. In addition to being a threat to Sri Lanka's biodiversity, climate change may cause disastrous consequences on various levels in such areas. Such consequences include: Affecting agricultural productivity, causing natural disasters like floods and droughts, increasing the spread of infectious illnesses, and finally undermining the living standards.

CLIMATE CHANGE IN CHINA

Climate change in China is having major effects on the economy, society and the environment. China is the largest emitter of carbon dioxide, through an energy infrastructure heavily focused on fossil fuels and coal. Also, other industries, such as a burgeoning construction industry and industrial manufacturing contribute heavily to carbon emissions. However, like other developing countries, on a per-capita basis, China's carbon emissions were considerably less than countries like the United States: as of 2016, they were the 51st most per capita emitter. It has also been noted that higher-income countries have outsourced emissions-intensive industries to China. On the basis of cumulative CO_2 emissions measured from 1751 through to 2017, China is responsible for 13% globally and about half of the United State's cumulative emissions.

China is suffering from the negative effects of global warming in agriculture, forestry and water resources, and is expected to continue to see increased impacts. China's government is taking some measures to increase renewable energy, and other decarbonization efforts, vowing to hit peak emissions before 2030 and be carbon neutral by 2060 by adopting "more vigorous policies and measures."

Greenhouse gas emissions

Greenhouse gas emissions by China are the largest of any country in the world both in production and consumption terms, and stem mainly from coal burning in China, including coal-fired power stations, coal mining, and blast furnaces producing iron

and steel. When measuring production-based emissions, China emitted over 14 gigatonnes (Gt) CO_{2eq} of greenhouse gases in 2019, 27% of the world total. When measuring in consumption-based terms, which adds emissions associated with imported goods and extracts those associated with exported goods, China accounts for 25% of global emissions.

Despite having the largest emissions in the world, China's large population means its per person emissions have remained considerably lower than those in the developed world. This corresponds to over 10.1 tonnes CO_{2eq} emitted per person each year, slightly over the world average and the EU average but significantly lower than the second largest emitter of greenhouse gases, the United States, with its 17.6 tonnes per person. In consumption terms, China emits slightly less, with over 6 tonnes in 2016, slightly above the world average, but less than the EU average (close to 8 tonnes) and less than the United States by more than a half, with close to 18 tonnes per person. Accounting for historic emissions, OECD countries produced four times more CO2 in cumulative emissions than China, due to developed countries' early start in industrialization.

Impacts on the natural environment

China has and will suffer some of the effects of global warming, including sea level rise, glacier retreat and air pollution.

Temperature and weather changes

There has also been an increased occurrence of climate-related disasters such as drought and flood, and the amplitude is growing. These events have grave consequences for productivity when they occur, and also create serious repercussions for the natural environment and infrastructure. This threatens the lives of billions and aggravates poverty.

A study published in 2017, using continuous and coherent severe weather reports from over 500 manned stations from 1961 to 2010, found a significant decreasing trend in severe weather occurrence across China, with the total number of severe weather days that have either thunderstorm, hail and/or damaging wind decreasing about 50% from 1961 to 2010. The reduction in severe

weather occurrences correlated strongly with the weakening of the East Asian summer monsoon.

China observed a ground average temperature increase of 0.24!/decade from 1951 to 2017, exceeding the global rate. The average precipitation of China was 641.3 mm in 2017, 1.8% more than the average precipitation of previous years. There was an annual increase in concentrations of carbon dioxide from 1990 to 2016. The annual mean concentration of atmospheric carbon dioxide, methane, and nitrous oxide at Wanliguan Station were 404.4 ppm, 1907 ppb, and 329.7 ppb separately in 2016, slightly higher than the global mean concentration in 2016.

Sea level rise

The sea level rise was 3.4mm/year from 1980 to 2019 compared to the global average of 3.2mm/year.

China's first National Assessment of Global Climate Change, released in the 2000s by the Ministry of Science and Technology (MOST), states that China already suffers from the environmental impacts of climate change: increase of surface and ocean temperature, rise of sea level. Temperatures in the Tibetan Plateau of China are rising four times faster than anywhere else (data from 2011). Rising sea level is an alarming trend because China has a very long and densely populated coastline, with some of the most economically developed cities such as Shanghai, Tianjin, and Guangzhou situated there. Chinese research has estimated that a one-meter rise in sea level would inundate 92,000 square kilometers of China's coast, thereby displacing 67 million people.

Climate change caused an increase in sea level, threatening to impair the functions of harbors.

Rising sea levels affect China's coastal land. Cities along the coast such as Shanghai, only 3–5 meters above sea level leaves its 18 million residents vulnerable. Sea levels in Victoria Harbor in Hong Kong have already risen .12 meters in the last 50 years.

Ecosystems

Climate change increases forest belt limits and frequencies of pests and diseases, decreases frozen earth areas, and threatens to decrease glacial areas in northwest China. The vulnerability of

ecosystems may increase due to future climate change. In the years 1970-2016 the occurrence of crop pest and diseases increased 4 times. 22% of that rise are due to climate change. By the year 2100 the occurrence will rise 243% under a low emission scenario and by 460% under a high emissions scenario. China is the biggest producer of wheat and rice in the world. It is in the second place in maize production.

China is home to 17,300 species of plants and animals: 667 vertebrates, ancient flora and fauna. Due to rising global temperatures, within the next century 20-30% of species will go extinct.

More than one fourth of China is covered by desert, which is growing due to desertification. Desertification in China destroys farmland, biodiversity, and exacerbates poverty.

Water resources

Climate change decreased total water resources in North China while increasing total water resources in South China. There were more floods, drought, and extreme weather events. There may be a big impact on the spatial and temporal distribution in China's water resources, increasing extreme weather events and natural disasters.

Glacier melting in the Northern Region of China causes flooding in the upper parts of the Yangtze River. This ruins soil and arable land. The glacial melting causes lower parts of the Yangtze River to have lower volumes of water, also disrupting farming.

Furthermore, climate change will worsen the uneven distribution of water resources in China. Outstanding rises in temperature would exacerbate evapotranspiration, intensifying the risk of water shortage for agricultural production in the North. Although China's southern region has an abundance of rainfall, most of its water is lost due to flooding. As the Chinese government faces challenges managing its expanding population, increased demand for water to support the nation's economic activity and people will burden the government. In essence, a water shortage is indeed a large concern for the country.

Overfishing and rising ocean temperatures are killing the coral reefs in the South China Sea. This lowers biodiversity, and negatively affects the fish market economy in China.

Impacts on people

Health impacts

Climate change has a significant impact on the health of Chinese people. The high temperature has caused health risks for some groups of people, such as older people (e"65 years old), outdoor workers, or people living in poverty. In 2019, each person who is older than 65 years had to endure extra 13 days of the heatwave, and 26,800 people died because of the heatwave this year.

In the future, the probability rate of malaria transmission will increase 39-140 percent if the temperature increase of 1-2 degrees Celsius in south China.

Economic impacts

Agriculture

The negative effects on China's agriculture caused by climate change have appeared. There was an increase in agricultural production instability, severe damages caused by high temperature and drought, and lower production and quality in the prairie. In the near future, climate change may cause negative influences, causing a reduction of output in wheat, rice, and corn, and change the agricultural distribution of production. China is also dealing with agricultural issues due global demands of products such as soybeans. This global demand is causing coupled effects that stretch across oceans which in turn is affecting other countries. Environmental factor#Socioeconomic Drivers

Fishing Industry

Due to overfishing, pollution, global temperature increase, and change in pH to the world's oceans, the South China Sea is suffering from a lack in biodiversity among marine life. Historically, China was the world's largest capture fisheries and aquaculture producer, making the fish market a significant part of the Chinese economy. Due to the environmental impacts, coral reefs in the South China Sea are dying, decreasing the amount of marine life in the South China Sea. Fisheries are not able to catch the amount of fish that was once brought to the fish market, making that part of the economy suffer. The amount of fishing in China is

unsustainable, and therefore declining. The fishing industry supplies a significant amount of jobs, exports, and domestic consumption, which will disappear if the fishing industry collapses.

MITIGATION AND ADAPTATION

Mitigation approaches

Renewable energy

Ensuring adequate energy supply to sustain economic growth has been a core concern of the Chinese government since 1949. The country is the world's largest emitter of greenhouse gases, and coal in China is a major cause of global warming. However, from 2010 to 2015 China reduced energy consumption per unit of GDP by 18%, and CO_2 emissions per unit of GDP by 20%. On a per-capita basis, it was the world's 51st largest emitter of greenhouse gases in 2016.

China is the world's leading country in electricity production from renewable energy sources, with over double the generation of the second-ranking country, the United States. By the end of 2019, the country had a total capacity of 790GW of renewable power, mainly from hydroelectric, solar and wind power. By the end of 2019, China's hydropower capacity reached 356 GW. China's installed capacity of solar power reached 252 GW and wind power capacity was 282 GW, as of 2020. China's renewable energy sector is growing faster than its fossil fuels and nuclear power capacity. China has pledged to achieve carbon neutrality before 2060 and peak emissions before 2030. By 2030, China aims to lower carbon dioxide emissions per unit of GDP by over 65 percent from the 2005 level, raise the share of non-fossil energy in primary energy use to around 25 percent, and bring the total installed capacity of wind and solar electricity to more than 1200GW.

Mitigation examples

Internally in the provinces of China, there are various projects held aiming to solve emissions reduction and energy-saving, which is a big step in tackling climate change. Beijing is developing in replacing traditional bulbs with energy-saving light bulbs. Provinces such as Rizhao and Dezhou are promoting solar energy

in the building heating system. Besides, Tsinghua University launched a lead on low-carbon city development. The city is currently working with Tsinghua University to improve the urban environment by introducing renewable energy into industries and households.

Adaptation approaches

China has experienced a seven-fold increase in the frequency of floods since the 1950s, rising every decade. The frequency of extreme rainfall has increased and is predicted to continue to increase in the western and southern parts of China. The country is currently undertaking efforts to reduce the threat of these floods (which have the potential effect of completely destroying vulnerable communities), largely focusing on improving the infrastructure responsible for tracking and maintaining adequate water levels. That being said, the country is promoting the extension of technologies for water allocation and water-saving mechanisms. In the country's National Climate Change Policy Program, one of the goals specifically set out is to enhance the ability to bear the impacts of climate change, as well as to raise the public awareness on climate change. China's National Climate Change Policy states that it will integrate climate change policies into the national development strategy. In China, this national policy comes in the form of its "Five Year Plans for Economic and Social Development". China's Five Year Plans serve as the strategic road maps for the country's development. The goals spelled out in the Five Year Plans are mandatory as government officials are held responsible for meeting the targets.

Policies and legislation

Climate change has not been a priority to China until recently (around 2008), when this issue was brought to a higher platform. Chinese state affairs operate as a central system, not a federal system. For example, the central government makes decisions and the local governments fulfill them. As a result, the local governments receive constraints and are measured by their performance from the central governments. Solving environmental issues such as climate change requires long-term investments in money, resources, and time. It is believed that these efforts will

be detrimental to economic growth, which is of particular importance to the promotion of local government executives. This is why local governments have no engagement in addressing this issue.

In China's first NDC submission, key areas were identified for climate change adaptation, including agriculture, water resources, and vulnerable areas. It also mentioned that an adaptation strategy should be implemented through regional strategies. Flooding in cities is being tackled by collecting and recycling rainwater. In 2013, China issued its National Strategy for Climate Change Adaptation and set goals of reducing vulnerability, strengthening monitoring, and raising public awareness. Efforts on implementation have been put in adapting forestry, meteorological management, infrastructure, and risk planning.

The development of technology and economy in China share more responsibility in tackling climate change. After facing the 2011 smog issue, China's government launched an extensive strategy, which is to improve air quality by reducing the growth of coal consumption. Nevertheless, the trade war that involved China as one of the leading participants has resulted in the loss of control of polluting industries, especially in the steel and cement during 2018. Fortunately, nearly 70 multinational and local brands implemented the monitoring data by The Institute of Public & Environmental Affairs (IPE) in China, stimulating nearly 8,000 suppliers approaching regulatory violations.

Paris agreement

The Paris agreement is a legally binding international agreement. Its main goal is to limit global warming to below 1.5 degrees Celsius, compared to pre-industrial levels. The Nationally Determined Contributions (NDCs) are the plans to fight climate change adapted for each country, which outlines specific goals and targets for the upcoming five years to help mitigate the effects of climate change. Every party in the agreement has different targets based on its own historical climate records and country's circumstances and all the targets for each country are stated in their NDC.

China is currently a member of the United Nations Framework Convention on Climate Change, the Paris Agreement. As a part

of this agreement it has agreed to the 2016 Nationally Determined Contributions (NDC).

The NDC target regarding the China against climate change and greenhouse gas emissions under the Paris agreement are the following:

- Peak of carbon dioxide emissions around 2030.
- 60% to 65% reduction of Carbon dioxide emission per unit of its gross domestic product (GDP), compared to 2005.
- Increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.

In the NDC of China there is a list of things that have been achieved by 2014:

- Proactive approach to climate change (for example enhancing mechanisms to effectively defend key areas).

Progress

Climate action tracker (CAT) is an independent scientific analysis that tracks government climate action and measures it against the globally agreed Paris Agreement. Climate action tracker found China actions to be "Highly insufficient".

On September 22, 2020, Chinese leader Xi Jinping stated: "China will increase its nationally determined contributions, adopt more powerful policies and measures, strive to reach the peak of carbon dioxide emissions by 2030, and strive to achieve carbon neutrality by 2060."

National carbon trading scheme

The Chinese national carbon trading scheme is an intensity-based trading system for carbon dioxide emissions by China, which started operating in 2021. This emission trading scheme (ETS) creates a carbon market where emitters can buy and sell emission credits. From this scheme, China can limit emissions, but allow economic freedom for emitters to reduce emissions or purchase emission allowances from other emitters. China is the largest emitter of greenhouse gases (GHG) and many major Chinese cities have severe air pollution. The scheme is run by the Ministry of Ecology and Environment, which eventually plans to limit emissions from six of China's top carbon dioxide emitting

industries. In 2021 it started with its power plants, and covers 40% of China's emissions, which is 15% of world emissions. China was able to gain experience in drafting and implementation of an ETS plan from the United Nations Framework Convention on Climate Change (UNFCCC), where China was part of the Clean Development Mechanism (CDM). From this experience with carbon markets, and lengthy discussions with the next largest carbon market, the European Union (EU), as well as analysis of small scale pilot markets in major Chinese cities and provinces, China's national ETS is the largest of its kind and will help China achieve its Nationally Determined Contribution (NDC) to the Paris Agreement. In July 2021 permits were being handed out for free rather than auctioned, and the market price per tonne of CO2e was around RMB 50, far less than the EU ETS and the UK ETS.

International cooperation

Attitudes of the Chinese government on climate change, specifically regarding the role of China in climate change action, have shifted notably in recent years. Historically, climate change was largely seen as a problem that has been created by and should be solved by industrialized countries; in 2015, China said it supports the "common but differentiated responsibilities" principle, which holds that since China is still developing, its abilities and capacities to reduce emissions are comparatively lower than developed countries'.

In 2018, the government has urged countries to continue to support the Paris agreement, even in the wake of the United States' withdrawal in 2017.

On September 22, 2020, Chinese leader Xi Jinping announced at the UN General Assembly in New York that his country will end its contribution to global heating and achieve carbon neutrality by 2060 by adopting "more vigorous policies and measures."

Both internationally and within the People's Republic of China, there has been an ongoing debate over China's economic responsibilities for climate change mitigation. The argument has been made that China has a crucial role to play in keeping global warming under 2 °C, and that this cannot be accomplished unless coal use, which accounts for the majority of China's emissions, falls sharply.

The People's Republic of China is an active participant in the climate change talks and other multilateral environmental negotiations, and claims to take environmental challenges seriously but is pushing for the developed world to help developing countries to a greater extent.

However the Belt and Road Initiative is constructing coal-fired power stations (for example Emba Hunutlu power station in Turkey) thus increasing greenhouse gas emissions from other countries.

China is a part of the United Nations Framework Convention on Climate Change, BASIC Alliance. This alliance is an international commitment to work in partnership with Brazil, South Africa, and India. BASIC's international commitments and goals are to be carbon net-zero before 2060, and to help achieve the global goal from the UNFCCC of reducing emissions to 1.5% degrees celsius before pre-industrial levels.

On 21 September 2021, at the UN General Assembly, Chinese leader Xi Jinping stated that China will no longer fund coal-fired power plants abroad. Xi also repeated the country's commitment to achieving carbon neutrality by 2060.

Society and culture

Public opinion

According to a study from 2017 conducted by the China Climate Change Communication program, 94% of interviewees supported fulfilling the Paris agreement, 96.8% of interviewees supported international cooperation on global climate change, and more than 70% of interviewees were willing to purchase products environmentally friendly. 98.7% of interviewees supported implementing climate change education at schools. Respondents were most concerned about the air pollution caused by climate change. The investigation included 4025 samples.

The investigation showed that Chinese citizens agreed that they were experiencing climate change and that it was caused by human activities.

Furthermore, most Chinese citizens believe individual action on climate change can help, although the government is still seen

as the entity most responsible for dealing with climate change. If the government does take action, fiscal and taxation policies are seen as potentially effective.

Activism

Calculations in 2021 showed that for giving the world a 50% chance of avoiding a temperature rise of 2 degrees or more China should increase its climate commitments by 7%. For a 95% chance it should increase the commitments by 24%. For giving a 50% chance of staying below 1.5 degrees China should increase its commitments by 41%.

MONSOON OF SOUTH ASIA

The monsoon of South Asia is among several geographically distributed global monsoons. It affects the Indian subcontinent, where it is one of the oldest and most anticipated weather phenomena and an economically important pattern every year from June through September, but it is only partly understood and notoriously difficult to predict. Several theories have been proposed to explain the origin, process, strength, variability, distribution, and general vagaries of the monsoon, but understanding and predictability are still evolving.

The unique geographical features of the Indian subcontinent, along with associated atmospheric, oceanic, and geophysical factors, influence the behavior of the monsoon. Because of its effect on agriculture, on flora and fauna, and on the climates of nations such as Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka – among other economic, social, and environmental effects – the monsoon is one of the most anticipated, tracked, and studied weather phenomena in the region. It has a significant effect on the overall well-being of residents and has even been dubbed the "real finance minister of India".

Definition

The word *monsoon* (derived from the Arabic "mausim", meaning "seasonal reversal of winds"), although generally defined as a system of winds characterized by a seasonal reversal of direction, lacks a consistent, detailed definition. Some examples are:

- The American Meteorological Society calls it a name for seasonal winds, first applied to the winds blowing over the Arabian Sea from the northeast for six months and from the southwest for six months. The term has since been extended to similar winds in other parts of the world.
- The Intergovernmental Panel on Climate Change (IPCC) describes a monsoon as a tropical and subtropical seasonal reversal in both surface winds and associated precipitation, caused by differential heating between a continental-scale land mass and the adjacent ocean.
- The India Meteorological Department defines it as the seasonal reversal of the direction of winds along the shores of the Indian Ocean, especially in the Arabian Sea, which blow from the southwest for half of the year and from the northeast for the other half.
- Colin Stokes Ramage, in *Monsoon Meteorology*, defines the monsoon as a seasonal reversing wind accompanied by corresponding changes in precipitation.

Background

Observed initially by sailors in the Arabian Sea traveling between Africa, India, and Southeast Asia, the monsoon can be categorized into two *branches* based on their spread over the subcontinent:

- Arabian Sea branch
- Bay of Bengal branch

Alternatively, it can be categorized into two *segments* based on the direction of rain-bearing winds:

- Southwest (SW) monsoon
- Northeast (NE) monsoon

Based on the time of year that these winds bring rain to India, the monsoon can also be categorized into two *periods*:

- Summer monsoon (May to September)
- Winter monsoon (October to November)

The complexity of the monsoon of South Asia is not completely understood, making it difficult to accurately predict the quantity, timing, and geographic distribution of the accompanying

precipitation. These are the most monitored components of the monsoon, and they determine the water availability in India for any given year.

Changes of the Monsoon

Monsoons typically occur in tropical areas. One area that monsoons impact greatly is India. In India monsoons create an entire season in which the winds reverse completely.

The rainfall is a result of the convergence of wind flow from the Bay of Bengal and reverse winds from the South China Sea.

The onset of the monsoon occurs over the Bay of Bengal in May, arriving at the Indian Peninsula by June, and then the winds move towards the South China Sea.

Effect of geographical relief features

Although the southwest and northeast monsoon winds are seasonally reversible, they do cause precipitation on their own.

Two factors are essential for rain formation:

1. Moisture-laden winds
2. Droplet formation

Additionally, one of the causes of rain must happen. In the case of the monsoon, the cause is primarily orographic, due to the presence of highlands in the path of the winds. Orographic barriers force wind to rise. Precipitation then occurs on the windward side of the highlands because of adiabatic cooling and condensation of the moist rising air.

The unique geographic relief features of the Indian subcontinent come into play in allowing all of the above factors to occur simultaneously. The relevant features in explaining the monsoon mechanism are as follows:

1. The presence of abundant water bodies around the subcontinent: the Arabian Sea, Bay of Bengal, and Indian Ocean. These help moisture accumulate in the winds during the hot season.
2. The presence of abundant highlands like the Western Ghats and the Himalayas right across the path of the southwest monsoon winds. These are the main cause of the substantial orographic precipitation throughout the subcontinent.

1. The Western Ghats are the first highlands of India that the southwest monsoon winds encounter. The Western Ghats rise abruptly from the Western Coastal Plains of the subcontinent, making effective orographic barriers for the monsoon winds.
2. The Himalayas play more than the role of orographic barriers for the monsoon. They also help confine it to the subcontinent. Without them, the southwest monsoon winds would blow right over the Indian subcontinent into Tibet, Afghanistan, and Russia without causing any rain.
3. For the northeast monsoon, the highlands of the Eastern Ghats play the role of orographic barrier.

Features of monsoon rains

There are some unique features of the rains that the monsoon brings to the Indian subcontinent.

"Bursting"

Bursting of monsoon refers to the sudden change in weather conditions in India (typically from hot and dry weather to wet and humid weather during the southwest monsoon), characterized by an abrupt rise in the mean daily rainfall. Similarly, the burst of the northeast monsoon refers to an abrupt increase in the mean daily rainfall over the affected regions.

Rain variability ("vagaries"*)*

One of the most commonly used words to describe the erratic nature of the monsoon is "vagaries", used in newspapers, magazines, books, web portals to insurance plans, and India's budget discussions. In some years, it rains too much, causing floods in parts of India; in others, it rains too little or not at all, causing droughts.

In some years, the rain quantity is sufficient but its timing arbitrary. Sometimes, despite average annual rainfall, the daily distribution or geographic distribution of the rain is substantially skewed. In the recent past, rainfall variability in short time periods (about a week) were attributed to desert dust over the Arabian Sea and Western Asia.

Ideal and normal monsoon rains

Normally, the southwest monsoon can be expected to "burst" onto the western coast of India (near Thiruvananthapuram) at the beginning of June and to cover the entire country by mid-July. Its withdrawal from India typically starts at the beginning of September and finishes by the beginning of October.

The northeast monsoon usually "bursts" around 20 October and lasts for about 50 days before withdrawing.

However, a rainy monsoon is not necessarily a normal monsoon – that is, one that performs close to statistical averages calculated over a long period. A normal monsoon is generally accepted to be one involving close to the *average quantity* of precipitation over all the geographical locations under its influence (*mean spatial distribution*) and over the entire expected time period (*mean temporal distribution*). Additionally, the *arrival date* and the *departure date* of both the southwest and northeast monsoon should be close to the mean dates. The exact criteria for a normal monsoon are defined by the India Meteorological Department with calculations for the mean and standard deviation of each of these variables.

THEORIES FOR MECHANISM OF MONSOON

Theories of the mechanism of the monsoon primarily try to explain the reasons for the seasonal reversal of winds and the timing of their reversal.

Traditional theory

Because of differences in the specific heat capacity of land and water, continents heat up faster than seas. Consequently, the air above coastal lands heats up faster than the air above seas. These create areas of low air pressure above coastal lands compared with pressure over the seas, causing winds to flow from the seas onto the neighboring lands. This is known as sea breeze.

Process of monsoon creation

Also known as the *thermal theory* or the *differential heating of sea and land theory*, the traditional theory portrays the monsoon as a large-scale sea breeze. It states that during the hot subtropical summers, the massive landmass of the Indian Peninsula heats up

at a different rate than the surrounding seas, resulting in a pressure gradient from south to north. This causes the flow of moisture-laden winds from sea to land. On reaching land, these winds rise because of the geographical relief, cooling adiabatically and leading to orographic rains. This is the *southwest monsoon*. The reverse happens during the winter, when the land is colder than the sea, establishing a pressure gradient from land to sea. This causes the winds to blow over the Indian subcontinent toward the Indian Ocean in a northeasterly direction, causing the *northeast monsoon*. Because the southwest monsoon flows from sea to land, it carries more moisture, and therefore causes more rain, than the northeast monsoon. Only part of the northeast monsoon passing over the Bay of Bengal picks up moisture, causing rain in Andhra Pradesh and Tamil Nadu during the winter months.

However, many meteorologists argue that the monsoon is not a local phenomenon as explained by the traditional theory, but a general weather phenomenon along the entire tropical zone of Earth. This criticism does not deny the role of differential heating of sea and land in generating monsoon winds, but casts it as one of several factors rather than the only one.

Dynamic theory

The prevailing winds of the atmospheric circulation arise because of the difference in pressure at various latitudes and act as means for distribution of thermal energy on the planet. This pressure difference is because of the differences in solar insolation received at different latitudes and the resulting uneven heating of the planet. Alternating belts of high pressure and low pressure develop along the equator, the two tropics, the Arctic Circle and Antarctic Circle, and the two polar regions, giving rise to the trade winds, the westerlies, and the polar easterlies. However, geophysical factors like Earth's orbit, its rotation, and its axial tilt cause these belts to shift gradually north and south, following the Sun's seasonal shifts.

Process of monsoon creation

The *dynamic theory* explains the monsoon on the basis of the annual shifts in the position of global belts of pressure and winds. According to this theory, the monsoon is a result of the shift of

the Intertropical Convergence Zone (ITCZ) under the influence of the vertical sun. Though the mean position of the ITCZ is taken as the equator, it shifts north and south with the migration of the vertical sun toward the Tropics of Cancer and Capricorn during the summer of the respective hemispheres (Northern and Southern Hemisphere).

As such, during the northern summer (May and June), the ITCZ moves north, along with the vertical sun, toward the Tropic of Cancer. The ITCZ, as the zone of lowest pressure in the tropical region, is the target destination for the trade winds of both hemispheres.

Consequently, with the ITCZ at the Tropic of Cancer, the southeast trade winds of the Southern Hemisphere have to cross the equator to reach it. However, because of the Coriolis effect (which causes winds in the Northern Hemisphere to turn right, whereas winds in the Southern Hemisphere turn left), these southeast trade winds are deflected east in the Northern Hemisphere, transforming into southwest trades. These pick up moisture while traveling from sea to land and cause orographic rain once they hit the highlands of the Indian Peninsula. This results in the southwest monsoon.

The dynamic theory explains the monsoon as a global weather phenomenon rather than just a local one. And when coupled with the traditional theory (based on the heating of sea and land), it enhances the explanation of the varying intensity of monsoon precipitation along the coastal regions with orographic barriers.

Jet stream theory

This theory tries to explain the establishment of the northeast and southwest monsoons, as well as unique features like "bursting" and variability.

The jet streams are systems of upper-air westerlies. They give rise to slowly moving upper-air waves, with 250-knot winds in some air streams. First observed by World War II pilots, they develop just below the tropopause over areas of steep pressure gradient on the surface. The main types are the *polar jets*, the *subtropical westerly jets*, and the less common *tropical easterly jets*. They follow the principle of geostrophic winds.

Process of monsoon creation

Over India, a subtropical westerly jet develops in the winter season and is replaced by the tropical easterly jet in the summer season. The high temperature during the summer over the Tibetan Plateau, as well as over Central Asia in general, is believed to be the critical factor leading to the formation of the tropical easterly jet over India.

The mechanism affecting the monsoon is that the westerly jet causes high pressure over northern parts of the subcontinent during the winter. This results in the north-to-south flow of the winds in the form of the northeast monsoon. With the northward shift of the vertical sun, this jet shifts north, too. The intense heat over the Tibetan Plateau, coupled with associated terrain features like the high altitude of the plateau, generate the tropical easterly jet over central India. This jet creates a low-pressure zone over the northern Indian plains, influencing the wind flow toward these plains and assisting the development of the southwest monsoon.

Theories for "bursting"

The "bursting" of the monsoon is primarily explained by the jet stream theory and the dynamic theory.

Dynamic theory

According to this theory, during the summer months in the Northern Hemisphere, the ITCZ shifts north, pulling the southwest monsoon winds onto the land from the sea. However, the huge landmass of the Himalayas restricts the low-pressure zone onto the Himalayas themselves. It is only when the Tibetan Plateau heats up significantly more than the Himalayas that the ITCZ rises abruptly and swiftly shifts north, leading to the bursting of monsoon rains over the Indian subcontinent. The reverse shift takes place for the northeast monsoon winds, leading to a second, minor burst of rainfall over the eastern Indian Peninsula during the Northern Hemisphere winter months.

Jet stream theory

According to this theory, the onset of the southwest monsoon is driven by the shift of the subtropical westerly jet north from over the plains of India toward the Tibetan Plateau. This shift is

due to the intense heating of the plateau during the summer months. The northward shift is not a slow and gradual process, as expected for most changes in weather pattern. The primary cause is believed to be the height of the Himalayas. As the Tibetan Plateau heats up, the low pressure created over it pulls the westerly jet north. Because of the lofty Himalayas, the westerly jet's movement is inhibited. But with continuous dropping pressure, sufficient force is created for the movement of the westerly jet across the Himalayas after a significant period. As such, the shift of the jet is sudden and abrupt, causing the bursting of southwest monsoon rains onto the Indian plains. The reverse shift happens for the northeast monsoon.

Theories for monsoon variability

The jet stream effect

The jet stream theory also explains the variability in timing and strength of the monsoon.

Timing: A timely northward shift of the subtropical westerly jet at the beginning of summer is critical to the onset of the southwest monsoon over India. If the shift is delayed, so is the southwest monsoon. An early shift results in an early monsoon.

Strength: The strength of the southwest monsoon is determined by the strength of the easterly tropical jet over central India. A strong easterly tropical jet results in a strong southwest monsoon over central India, and a weak jet results in a weak monsoon.

El Niño–Southern Oscillation effect

El Niño is a warm ocean current originating along the coast of Peru that replaces the usual cold Humboldt Current. The warm surface water moving toward the coast of Peru with El Niño is pushed west by the trade winds, thereby raising the temperature of the southern Pacific Ocean. The reverse condition is known as La Niña.

Southern Oscillation, a phenomenon first observed by Sir Gilbert Walker, director general of observatories in India, refers to the seesaw relationship of atmospheric pressures between Tahiti and Darwin, Australia. Walker noticed that when pressure was high in Tahiti, it was low in Darwin, and vice versa. A *Southern Oscillation*

Index (SOI), based on the pressure difference between Tahiti and Darwin, has been formulated by the Bureau of Meteorology (Australia) to measure the strength of the oscillation. Walker noticed that the quantity of rainfall in the Indian subcontinent was often negligible in years of high pressure over Darwin (and low pressure over Tahiti). Conversely, low pressure over Darwin bodes well for precipitation quantity in India. Thus, Walker established the relationship between southern oscillation and quantities of monsoon rains in India.

Ultimately, the southern oscillation was found to be simply an atmospheric component of the El Niño/La Niña effect, which happens in the ocean. Therefore, in the context of the monsoon, the two together came to be known as the El Niño–Southern Oscillation (ENSO) effect. The effect is known to have a pronounced influence on the strength of the southwest monsoon over India, with the monsoon being weak (causing droughts) during El Niño years, while La Niña years bring particularly strong monsoons.

Indian Ocean dipole effect

Although the ENSO effect was statistically effective in explaining several past droughts in India, in recent decades, its relationship with the Indian monsoon seemed to weaken. For example, the strong ENSO of 1997 did not cause drought in India. However, it was later discovered that, just like ENSO in the Pacific Ocean, a similar seesaw ocean-atmosphere system in the Indian Ocean was also in play. This system was discovered in 1999 and named the Indian Ocean Dipole (IOD). An index to calculate it was also formulated. IOD develops in the equatorial region of the Indian Ocean from April to May and peaks in October. With a positive IOD, winds over the Indian Ocean blow from east to west. This makes the Arabian Sea (the western Indian Ocean near the African coast) much warmer and the eastern Indian Ocean around Indonesia colder and drier. In negative dipole years, the reverse happens, making Indonesia much warmer and rainier. A positive IOD index often negates the effect of ENSO, resulting in increased monsoon rains in years such as 1983, 1994, and 1997. Further, the two poles of the IOD – the eastern pole (around Indonesia) and the western pole (off the African coast) — independently and cumulatively affect the quantity of monsoon rains.

Equatorial Indian Ocean oscillation

As with ENSO, the atmospheric component of the IOD was later discovered and the cumulative phenomenon named *Equatorial Indian Ocean oscillation* (EQUINOO). When EQUINOO effects are factored in, certain failed forecasts, like the acute drought of 2002, can be further accounted for. The relationship between extremes of the Indian summer monsoon rainfall, along with ENSO and EQUINOO, have been studied, and models to better predict the quantity of monsoon rains have been statistically derived.

Impact of climate change

Since 1950s, the South Asian summer monsoon has been exhibiting large changes, especially in terms of droughts and floods. The observed monsoon rainfall indicates a gradual decline over central India, with a reduction of up to 10%.

This is primarily due to a weakening monsoon circulation as a result of the rapid warming in the Indian Ocean, and changes in land use and land cover, while the role of aerosols remain elusive. Since the strength of the monsoon is partially dependent on the temperature difference between the ocean and the land, higher ocean temperatures in the Indian Ocean have weakened the moisture bearing winds from the ocean to the land. The reduction in the summer monsoon rainfall have grave consequences over central India because at least 60% of the agriculture in this region is still largely rain-fed.

A recent assessment of the monsoonal changes indicate that the land warming has increased during 2002–2014, possibly reviving the strength of the monsoon circulation and rainfall. Future changes in the monsoon will depend on a competition between land and ocean—on which is warming faster than the other.

Meanwhile, there has been a three-fold rise in widespread extreme rainfall events during the years 1950 to 2015, over the entire central belt of India, leading to a steady rise in the number of flash floods with significant socioeconomic losses. Widespread extreme rainfall events are those rainfall events which are larger than 150 mm/day and spread over a region large enough to cause floods.

MONSOON RAIN PREDICTION MODELS

Since the Great Famine of 1876–1878 in India, various attempts have been made to predict monsoon rainfall. At least five prediction models exist.

Seasonal Prediction of Indian Monsoon (SPIM)

The Centre for Development of Advanced Computing (CDAC) at Bengaluru facilitated the Seasonal Prediction of Indian Monsoon (SPIM) experiment on the PARAM Padma supercomputing system. This project involved simulated runs of historical data from 1985 to 2004 to try to establish the relationship of five *atmospheric general circulation models* with monsoon rainfall distribution.

India Meteorological Department model

The department has tried to forecast the monsoon for India since 1884, and is the only official agency entrusted with making public forecasts about the quantity, distribution, and timing of the monsoon rains. Its position as the sole authority on the monsoon was cemented in 2005 by the Department of Science and Technology (DST), New Delhi. In 2003, IMD substantially changed its forecast methodology, model, and administration. A sixteen-parameter monsoon forecasting model used since 1988 was replaced in 2003. However, following the 2009 drought in India (worst since 1972), The department decided in 2010 that it needed to develop an "indigenous model" to further improve its prediction capabilities.

Significance

The monsoon is the primary delivery mechanism for fresh water in the Indian subcontinent. As such, it affects the environment (and associated flora, fauna, and ecosystems), agriculture, society, hydro-power production, and geography of the subcontinent (like the availability of fresh water in water bodies and the underground water table), with all of these factors cumulatively contributing to the health of the economy of affected countries. The monsoon turns large parts of India from semi-deserts into green grasslands.

Geographical (wettest spots on Earth)

Mawsynram and Cherrapunji, both in the Indian state of Meghalaya, alternate as the wettest places on Earth given the

quantity of their rainfall, though there are other cities with similar claims. They receive more than 11,000 millimeters of rain each from the monsoon.

Agricultural

In India, which has historically had a primarily agrarian economy, the services sector recently overtook the farm sector in terms of GDP contribution. However, the agriculture sector still contributes 17–20% of GDP and is the largest employer in the country, with about 60% of Indians dependent on it for employment and livelihood. About 49% of India's land is agricultural; that number rises to 55% if associated wetlands, dryland farming areas, etc., are included. Because more than half of these farmlands are rain-fed, the monsoon is critical to food sufficiency and quality of life.

Despite progress in alternative forms of irrigation, agricultural dependence on the monsoon remains far from insignificant. Therefore, the agricultural calendar of India is governed by the monsoon. Any fluctuations in the time distribution, spatial distribution, or quantity of the monsoon rains may lead to floods or droughts, causing the agricultural sector to suffer. This has a cascading effect on the secondary economic sectors, the overall economy, food inflation, and therefore the general population's quality and cost of living.

Economic

The economic significance of the monsoon is aptly described by Pranab Mukherjee's remark that the monsoon is the "real finance minister of India". A good monsoon results in better agricultural yields, which brings down prices of essential food commodities and reduces imports, thus reducing food inflation overall. Better rains also result in increased hydroelectric production. All of these factors have positive ripple effects throughout the economy of India.

The down side however is that when monsoon rains are weak, crop production is low leading to higher food prices with limited supply. As a result, the Indian government is actively working with farmers and the nation's meteorological department to produce more drought resistant crops.

Health

The onset of the monsoon increases fungal and bacterial activity. A host of mosquito-borne, water-borne and air-borne infections become more common as a result of the change in the ecosystem. These include diseases such as dengue, malaria, cholera, and colds.

Social

D. Subbarao, former governor of the Reserve Bank of India, emphasized during a quarterly review of India's monetary policy that the lives of Indians depend on the performance of the monsoon. His own career prospects, his emotional well-being, and the performance of his monetary policy are all "a hostage" to the monsoon, he said, as is the case for most Indians. Additionally, farmers rendered jobless by failed monsoon rains tend to migrate to cities. This crowds city slums and aggravates the infrastructure and sustainability of city life.

Travel

In the past, Indians usually refrained from traveling during monsoons for practical as well as religious reasons. But with the advent of globalization, such travel is gaining popularity.

Places like Kerala and the Western Ghats get a large number of tourists, both local and foreigners, during the monsoon season. Kerala is one of the top destinations for tourists interested in Ayurvedic treatments and massage therapy.

One major drawback of traveling during the monsoon is that most wildlife sanctuaries are closed. Also, some mountainous areas, especially in Himalayan regions, get cut off when roads are damaged by landslides and floods during heavy rains.

Environmental

The monsoon is the primary bearer of fresh water to the area. The peninsular/Deccan rivers of India are mostly rain-fed and non-perennial in nature, depending primarily on the monsoon for water supply. Most of the coastal rivers of Western India are also rain-fed and monsoon-dependent. As such, the flora, fauna, and entire ecosystems of these areas rely heavily on the monsoon.

VEGETATION

Vegetation is an assemblage of plant species and the ground cover they provide. It is a general term, without specific reference to particular taxa, life forms, structure, spatial extent, or any other specific botanical or geographic characteristics. It is broader than the term *flora* which refers to species composition. Perhaps the closest synonym is plant community, but *vegetation* can, and often does, refer to a wider range of spatial scales than that term does, including scales as large as the global. Primeval redwood forests, coastal mangrove stands, sphagnum bogs, desert soil crusts, roadside weed patches, wheat fields, cultivated gardens and lawns; all are encompassed by the term *vegetation*.

The vegetation type is defined by characteristic dominant species, or a common aspect of the assemblage, such as an elevation range or environmental commonality. The contemporary use of *vegetation* approximates that of ecologist Frederic Clements' term earth cover, an expression still used by the Bureau of Land Management.

History of definition

The distinction between vegetation (the general appearance of a community) and flora (the taxonomic composition of a community) was first made by Jules Thurmann (1849). Prior to this, the two terms (vegetation and flora) were used indiscriminately, and still are in some contexts. Augustin de Candolle (1820) also made a similar distinction, but he used the terms "station" (habitat type) and "habitation" (botanical region). Later, the concept of vegetation would influence the usage of the term biome, with the inclusion of the animal element.

Other concepts similar to vegetation are "physiognomy of vegetation" (Humboldt, 1805, 1807) and "formation" (Grisebach, 1838, derived from "*Vegetationsform*", Martius, 1824).

Departing from Linnean taxonomy, Humboldt established a new science, dividing plant geography between taxonomists who studied plants as taxa and geographers who studied plants as vegetation. The physiognomic approach in the study of vegetation is common among biogeographers working on vegetation on a world scale, or when there is a lack of taxonomic knowledge of

someplace (e.g., in the tropics, where biodiversity is commonly high).

The concept of "vegetation type" is more ambiguous. The definition of a specific vegetation type may include not only physiognomy but also floristic and habitat aspects. Furthermore, the phytosociological approach in the study of vegetation relies upon a fundamental unit, the plant association, which is defined upon flora.

Classifications

There are many approaches for the classification of vegetation (physiognomy, flora, ecology, etc.). Much of the work on vegetation classification comes from European and North American ecologists, and they have fundamentally different approaches. In North America, vegetation types are based on a combination of the following criteria: climate pattern, plant habit, phenology and/or growth form, and dominant species. In the current US standard (adopted by the Federal Geographic Data Committee (FGDC), and originally developed by UNESCO and The Nature Conservancy), the classification is hierarchical and incorporates the non-floristic criteria into the upper (most general) five levels and limited floristic criteria only into the lower (most specific) two levels. In Europe, classification often relies much more heavily, sometimes entirely, on floristic (species) composition alone, without explicit reference to climate, phenology or growth forms. It often emphasizes indicator or diagnostic species which may distinguish one classification from another.

In the FGDC standard, the hierarchy levels, from most general to most specific, are: *system, class, subclass, group, formation, alliance,* and *association*. The lowest level, or association, is thus the most precisely defined, and incorporates the names of the dominant one to three (usually two) species of a type. An example of a vegetation type defined at the level of class might be "*Forest, canopy cover* > *60%*"; at the level of a formation as "*Winter-rain, broad-leaved, evergreen, sclerophyllous, closed-canopy forest*"; at the level of alliance as "*Arbutus menziesii* forest"; and at the level of association as "*Arbutus menziesii-Lithocarpus dense flora* forest", referring to Pacific madrone-tanoak forests which occur in California and Oregon, USA. In practice, the levels of the alliance

and/or an association are the most often used, particularly in vegetation mapping, just as the Latin binomial is most often used in discussing particular species in taxonomy and in general communication.

Dynamics

Like all the biological systems, plant communities are temporally and spatially dynamic; they change at all possible scales. Dynamism in vegetation is defined primarily as changes in species composition and/or vegetation structure.

Temporal dynamics

Temporally, a large number of processes or events can cause change, but for sake of simplicity, they can be categorized roughly as either abrupt or gradual. Abrupt changes are generally referred to as disturbances; these include things like wildfires, high winds, landslides, floods, avalanches and the like. Their causes are usually external (exogenous) to the community—they are natural processes occurring (mostly) independently of the natural processes of the community (such as germination, growth, death, etc.). Such events can change vegetation structure and composition very quickly and for long time periods, and they can do so over large areas. Very few ecosystems are without some type of disturbance as a regular and recurring part of the long term system dynamic. Fire and wind disturbances are particularly common throughout many vegetation types worldwide. Fire is particularly potent because of its ability to destroy not only living plants, but also the seeds, spores, and living meristems representing the potential next generation, and because of fire's impact on fauna populations, soil characteristics and other ecosystem elements and processes.

Temporal change at a slower pace is ubiquitous; it comprises the field of ecological succession. Succession is the relatively gradual change in structure and taxonomic composition that arises as the vegetation itself modifies various environmental variables over time, including light, water and nutrient levels. These modifications change the suite of species most adapted to grow, survive and reproduce in an area, causing floristic changes. These floristic changes contribute to structural changes that are inherent in plant growth even in the absence of species changes (especially where

plants have a large maximum size, i.e. trees), causing slow and broadly predictable changes in the vegetation. Succession can be interrupted at any time by disturbance, setting the system either back to a previous state, or off on another trajectory altogether. Because of this, successional processes may or may not lead to some static, final state. Moreover, accurately predicting the characteristics of such a state, even if it does arise, is not always possible. In short, vegetative communities are subject to many variables that together set limits on the predictability of future conditions.

Spatial dynamics

As a general rule, the larger an area under consideration, the more likely the vegetation will be heterogeneous across it. Two main factors are at work. First, the temporal dynamics of disturbance and succession are increasingly unlikely to be in synchrony across any area as the size of that area increases. That is, different areas will be at different developmental stages due to different local histories, particularly their times since last major disturbance. This fact interacts with inherent environmental variability (e.g. in soils, climate, topography, etc.), which is also a function of area. Environmental variability constrains the suite of species that can occupy a given area, and the two factors together interact to create a mosaic of vegetation conditions across the landscape. Only in agricultural or horticultural systems does vegetation ever approach perfect uniformity. In natural systems, there is always heterogeneity, although its scale and intensity will vary widely..

NATURAL VEGETATION AND SOILS OF ASIA

The natural vegetation is perhaps the best summary of the physical environment, for it reflects the temperature, rainfall, drain-age, elevation and soil conditions. In nature, all physical phenomena are interre-lated; together, these provide us with an understanding of the physical environ-ment.

The patterns of their distribution and interactions are of crucial importance to us, as we have to depend on these for our sustenance. However, we have sub-stantially modified the natural vegetation and the soils that were present before hu-man intervention and

that have been replaced by other forms. It is important to note that over one- third of the continent's surface has been cleared for human settlement or given to permanent agriculture. Vegetation in such areas no longer remains "natural". In most areas of dense settlement the original vege-tation has been entirely removed and no trace of undisturbed forest remains.

Thus, the Indus-Ganga plains in India, lower Chao plains in Thailand, the lower basin of Huanghe, Chang Jiang, and Xi Jiang riv-ers in China are almost covered with cropland. Throughout these and other in-tensely settled areas in Java (Indonesia) and Japan, imported plants have replaced the indigenous vegetation.

Original cover can only be found in the remote and inhospitable areas, such as northern and northeastern Siberia, and parts of Southeast Asia. Reflecting the growing awareness of the consequences of deforestation and loss of natural vegeta-tion, reforestation is becoming increasingly popular, and preservation and recovery of forest areas has become a national priority for several Asian nations, although this practice is not as widespread as in the U.S.A. or in the European nations.

The nations in the Indian subconti-nent, because of their enormous populations and deficiency in timber re-sources, are sensitive to the issue and have launched several reforestation pro-grammes. China, Malaysia, and Turkey have also included in their national plans aimed at increasing forest lands and in the case of Turkey to reduce timber imports.

Asia's enormous territory, immense variety of relief and a wide range of cli-mates combine to produce most types of vegetation forms. A dominant feature of the continent's vegetation is that a larger territory on the western side has no oce-anic border, and receives scanty rainfall in relation to summer temperatures that can allow appreciable forest growth. The broad pattern of natural vegeta-tion generally follows the climatic types; it is thus convenient and useful to describe it in association with the climatic patterns of Asia.

The Tundra

The Tundra climatic type correlates with its namesake vegetation, Tundra vegetation that borders the Arctic Ocean. It is a region of cold, treeless plains with permanently frozen subsoil.

Lichens, mosses, sedges and some grasses may oc-cupy more favored locations. The Tundra belt extends to 70°N and with further south extensions on high altitudes (Chersk, Verkhoyansk and Kamachatka mountains).

The Taiga

South of the Tundra region is the Taiga, a belt of coniferous forests, or the needle-leaf evergreen forest, with a small, transitional zone of "wooden tun-dra". It covers most of Siberia from the Urals to the Pacific and northern part of Japan. The trees have small leaves, deep roots, and thick bark, and thus most spe-cies (pine, spruce, fir, etc.) are successful in cold and dry environment. Further east and southwest of Siberia is a transitional zone of coniferous forest mixed with hardy, deciduous trees such as aspen and birch, with sections of grass and shrubs in the drier areas.

Temperate Grasslands, the Steppes

To the south of Taiga is elongated, unbro-ken stretch of the Steppes from Ukraine to Manchuria—a broad belt of several thou-sand miles of temperate grasslands in southern Siberia— a parkland country of open grasses. There is some precipitation although the winters are still very cold, but the extreme temperature ranges of the Taiga are softened by the warm summers. However, the higher elevations in the mountains are covered with forests, and the dry valleys are bare except for the occa-sional cultivated oases.

Mediterranean Scrubland and Forest

A belt of scrub forest that is particularly at-tuned to the Mediterranean climatic regime rims the eastern shore of the Medi-terranean that includes the countries of Israel, Lebanon, Syria, Iraq, and the pla-teaus of Turkey and Iran. The summers are hot and dry; the winters mild and moist. Thus, the circumstances for the plant community are unusual; winters be-come the growing period.

Plants must adapt to conditions of drought and higher temperatures in summers. They share the adaptive characteristics of small plant size, short leaves, deep roots, and thick barks to retain moisture. The most distinctive vege-tation community of this region consists of a scrubland and short trees.

Desert Vegetation

The desert climatic and associated vegetation types are found in the trade wind deserts of the Arabian Peninsula, the deserts of Tibet, Mongolia, and the desert-like steppe-lands bordering the Caspian Sea. The mid-latitude deserts of Tibet and Mongolia in the interior re-semble the Arabian Desert only in aridity, but contain a clear altitudinal zonation of vegetation.

Plant cover in the deserts is sparse, with a considerable bare ground dotted by a scattering of individual plants. Typically, the plants are moisture-combat-ing, waxy, deep-rooted or thorny shrubs and sporadic stunted trees. The upper reaches of the highlands in Tibet or Mon-golia may be bare, or contain Taiga- and Tundra-like vegetation depending on the amount of available moisture.

Monsoon Region

This region is asso-ciated with monsoon climates. The natural vegetation varies with the amount of an-nual rainfall. Areas receiving between 40 and 80 inches of rainfall annually contain tropical deciduous (shedding leaves season-ally) forests, and those which receive less than 40 inches have savanna (tall grasses) and steppe-like (of short grasses) vegeta-tion, below which semi-desert and desert vegetation prevails. The monsoon lands have been extensively modified by human settlement and put to cultivation, and little trace of the original vegetation survives.

Tropical Rainforest

Tropical rain-forests are typical to the equatorial regions. In Malaysia and Indonesia rainforests cover large section of the countries, whereas in southern Sri Lanka and Java they have almost entirely replaced by agricultural landscapes where plantations of tea, coconut palms, and rubber trees cover the Mountain slopes and hills.

The vegetation consists of evergreen, broad-leafed tall, 2ense, high-crowned trees of several species having a dense canopy above the floor because the region gets a high amount of precipitation throughout the year, and is constantly warm. The savannas and deciduous trees cover the ground, the subequatorial and the areas that lie in the rain shadow on the leeward slopes.

VEGETATION IN THE MOUNTAINS

The mountains of southern and eastern Asia show a remarkable altitudinal zonation in natural vegetation. A zone of forest followed higher up by meadows, and snow cover at the highest elevations is charac-teristic. On the lower slopes are the broad-leafed deciduous forests, and on higher ground the coniferous trees occur.

Still higher up stunted trees, subalpine meadows and near the highest ridges per-ennial snow, and glaciers are found in a vertical zonation pattern. Elsewhere in the equatorial region in Malaysia and Greater Sunda Islands, (Indonesia) where the snow line is very high and moist-hot conditions predominate, the vegetation zonation is practically absent.

SOILS

Along with the climate the distribution of soils is critically important to agricultural productivity, and thus has a special signifi-cance for nations of Asia, as most Asians depend on agriculture for their livelihood. In the preceding paragraphs, wide range of interacting natural phenomena: climate, natural vegetation, parent rock material and relief features that determine the development and nature of soils have been discussed for the Asian continent.

Soil classification is both complicated and subject to constant revision. In the case of Asia, the difficulty is compounded by the fact that a large part of it is physi-cally remote, or climatically inhospitable for field surveys. Most of Asia has been surveyed unequally based on different sys-tems with the result that comparable knowledge of soil types and their charac-teristics is difficult to obtain.

Some part of the continent still remains un-surveyed. In addition, the most commonly used current classification at the present time—that of the U.S. Department of Agriculture known as the Seventh Approximation— has not gained much acceptance in most Asian nations.

It may be interesting and sobering to realize that a small fraction of Asia's land surface is blessed with really rich soils that have given sustenance to a large mass of humanity.

At the broad scale of our study, it may be convenient to generalize the distribu-tion patterns of soils by recognizing that there are basically three complex processes by which soils are formed; those of the hu-mid latitudes, of the tropical regions and of the deserts. Each of these processes are re-sponsible for the formation of specific types of soils which can be defined in broad terms.

The processes produce either the pedocals or calcium-bearing soils, or the pedalfers, the aluminum-bearing or nitro- gen-bearing soils. The letters "cal", "al", "fe" representing three distinctive elements in soils. In simple terms, this division separates the basic soils from the acidic soils. Soil patterns based on such classification point to some general tropi-cal regions.

Two fundamental soil-forming processes operate in the humid regions; podzolization in the cool, wet regions, and Laterization in the hot, wet regions. Podzolization is thought to remove the soluble salts, iron and aluminum com-pounds from the surface horizons, leaving a gray silica residue; and laterization begins by removing the salts, and transferring the iron and aluminum compounds near the surface with clays accumulating just underneath them.

Soils in the tropical areas are generally lateritic, having varying degrees of red or black color. The soils are rich in aluminum and iron oxides, low in silica; are nearly structureless and generally of low fertility. Most soils of South and Southeast Asia be-long to this category. In the Arabian Desert and deserts in Central Asia the soils are usually high in their content of unleached minerals, but may be deficient in their con-tent of nitrogen and humus (decomposed vegetative materials of the wet tropics).

Where the water-table is high, evaporation salts have accumulated in excess near the surface, the soils are alkaline. Such red de-sert soils cover much of the Arabian Peninsula and northwest India, while higher desert soils cover the rest of south-west Asian countries.

Large parts of northern Asia are cov-ered by podzolic soils of varying, but generally low fertility. These soils cover the mid-to high-latitude locations in the re-gion of well-distributed rainfall (in coniferous forest of a taiga forest zone) from the Urals to

Kamchatka. In much of northern China and Manchuria soils belong to the gray-brown podzolic category.

In the Mediterranean lands the pattern of soils is complicated. While cool tem-peratures and some rainfall produce podzolic conditions during winter, hot summers complicate the conditions when surface evaporation exceeds rainfall and moisture moves upward through capillary action and the podzolization process no longer operates. The grasslands of western Siberia, Manchuria, and most of Anatolia plateau of Turkey are underlain by black prairie and chernozem soils which have good tex-ture and are of generally high fertility.

From the standpoint of agricultural productivity, the most important soils in Asia are the relatively immature soils of alluvial origin that are found in the river valleys. These soils are among the richest in plant nutrients which can maintain their fertility through periodic inundatation by silt-bearing waters from the rivers in flood.

Alluvial soils cover the river val-leys of the Tigris-Euphrates, the plains of Indus-Ganga Rivers, the lower Irrawaddy basin, the deltas of the Mekong and the lower basins of Chang Jiang, Huanghe Rivers, as well as the river plains of smaller rivers in India, Malaysia, the Philippines, Taiwan, Korea, and Japan. These, in a very large measure, provide substance to the growing population of Asia.

Several islands of Indonesia and south-ern Philippines contain active volcanoes that periodically provide a new layer of rich basic soils of recently deposited vol-canic materials (not all volcanic soil consists of basic material; some retain their fertility for long periods as these are re-newed occasionally by new deposits, and account for enormous densities of rural population in Java and some areas of the Philippines).

Soils in the hilly and mountainous re-gions are produced by geologic structure, altitude, and temperature conditions to a greater degree than elsewhere. These may be lumped together as montane soils. A good part of the Asian surface of the uplands is too steep for the formation of deep soils. Skeletal soils are found in such areas, much of which are cropped by shift-ing cultivation, in which the cyclical use of land provides periodic regeneration of plant nutrients.

In northwest China some areas are covered by a thin layer of wind-blown ma-terial dating from the retreat of the ice sheet during the most recent Ice Age. This material is known by the term loess, and adds considerably to the natural fertility of the soil and thus to the agricultural pro-ductivity of the area.

Surveying the overall picture of soil distribution in Asia, it can be concluded that for its size, much of the continent of-fers limited opportunities for productive agricultural land. No more than 20 percent of the land surface is estimated to contain soils suitable for agriculture and a good quarter of this percentage contains soils of marginal value.

Tropical and subtropical soils are generally immature and unpro-ductive. The soils of the middle latitudes are themselves suitable, but lack of water is often a key factor. Only the alluvial soils of the river plains and the basic soils pro-duced by the volcanic ejecta are productive soils.

Several of the river basins, where the soils are rich, have been settled for hun-dreds of centuries and the soil cropped by hundreds of generations of farmers, and where enormous population densities are straining agricultural productivity. In such lands good soil management is an impor-tant factor as an agricultural resource.

Most Asian farmers have not taken to farming practices restoring plant nutrients to the soils they farm. The diffusion of the Green Revolution is still limited to a few, selected areas in India, Pakistan, Sri Lanka, the Philippines, and Taiwan where farmers have been making use of superior seeds of hybrid plant varieties, chemical fertilizers, and mechanized farming.

4

Agricultural Systems in South Asia: Nature and Contemporary Crisis

AGRICULTURE OF ASIA

By far the greater part of Asia remains uncultivated, primarily because climatic and soil conditions are unfavourable. Conversely, in the best growing areas an extraordinarily intensive agriculture is practiced, made possible by irrigating the alluvial soils of the great river deltas and valleys. Of the principal crops cultivated, rice, sugarcane, and, in Central Asia, sugar beets require the most water. Legumes, root crops, and cereals other than rice can be grown even on land watered only by natural precipitation.

Agricultural technology

The traditional method of irrigation in Asia is by gravity water flow. The water from upstream storage reservoirs or diversion dams is carried through canals to field distributaries. In some systems the fields adjoin one another, and the water is able to flow from one field to the next; it may, however, take some time for the water to move across the fields back to the canal system. The disadvantages of this system include water loss by evaporation and seepage and the possibility that the continuously flowing water will carry with it soil nutrients, fertilizers, and pesticides.

In Japan and Taiwan water is moved by small electric pumps, which operate continuously during the growing seasons.

Increasing attention has been given to pumping underground water. The use of ordinary pumps as well as of deep-bore well turbine pumps has become common, especially in India, Pakistan, and Iran. Such irrigation avoids some of the disadvantages of flow irrigation and allows for easier drainage.

The most important modern development in Asian agriculture has been the introduction of new high-yielding strains of cereals. Several Asian countries have utilized this technology, and the yield per acre for cereals has increased substantially since the late 1960s. These improved yields can be attributed to partnership between international organizations, such as the International Rice Research Institute (IRRI) in the Philippines, and national agricultural research stations. Thus, in the case of rice, countries have adapted the IRRI strains to local conditions and have implemented their own seed improvement programs and extension (advisory) services to farmers. Access to a reliable water supply has been crucial to the new agricultural technology, which has also required using fertilizer in conjunction with the improved cereal seeds that have been developed. Huge irrigation projects in southern Siberia, Central Asia, and Pakistan have been rapidly altering traditional agricultural patterns.

PRINCIPAL CROPS

Cereals and grains

Rice is the staple food crop for most Asians. Asia produces some 90 percent of the world's total supply of rice. Except in the Middle East, Pakistan, Afghanistan, Siberia, Central Asia, and Malaysia, rice occupies more land area than any other single crop. The total proportion of land under rice cultivation, as compared with total arable land, is highest in Vietnam, Bangladesh, and Sri Lanka; it varies between one-fourth and half in most Asian countries outside the Middle East, Central Asia, and Siberia. In spite of this, many countries (among them Sri Lanka and Bangladesh) are not self-sufficient in rice. Thailand, Pakistan, and Vietnam are notable rice exporters.

The black-earth (chernozem) belt across southern Siberia is cultivated with several grains, of which wheat is the most important. Wheat is also the dominant crop in Central Asia (notably Kazakhstan), the Middle East, Afghanistan, and Pakistan. Grain crops, chiefly wheat, are cultivated in North China—where soybeans are also grown—and in Japan. Barley is grown in China and India, among other countries. Corn (maize) is raised in China, Siberia, Central Asia, India, the Philippines, Thailand, North Korea, and other countries. India, China, Pakistan, and Central Asia also grow sorghum and millet. Intensive use of water resources from wells and from river-fed irrigation systems has enabled grain crops to be raised in Iraq, Iran, Pakistan, and northern India.

Fruits and vegetables

The continent produces a variety of tropical and subtropical fruit, mainly for domestic consumption. Transport facilities, where available, can be used only for limited distances. In view of the climatic conditions and the general lack of refrigerated transport, consumption tends to be seasonal and confined to areas close to centres of production. Among the main varieties of fruit produced are bananas, mangoes, apples, oranges and other citrus fruits, pineapples, papayas, and some specialities such as mangosteen (a dark reddish brown fruit), litchi (a grape-shaped fruit in a brittle red rind), and durian (a large oval fruit with a prickly rind, a soft pulp, and a distinctive odour). Citrus fruit is produced in the lands bordering the Mediterranean Sea, in Transcaucasia, and in China and Japan. Taiwan, the Philippines, and Malaysia export bananas to Japan.

Except in a few countries—such as the Philippines, Taiwan, and Malaysia, which grow and can pineapples for export—canning surplus fruit has been developed only to a limited extent. In view of the tremendous potential for greater fruit production, it is possible to increase canning of both fruits and fruit juices for export.

The same factors affect the production of vegetables. Vegetables are grown mainly for local consumption, and only tubers can be transported over distances and stored for any period of time. Taiwan has had success canning mushrooms and asparagus, and both products have become leading exports.

Cash crops

Asia is noted for several plantation cash crops, of which the most important are tea, rubber, palm oil, coconuts, and sugarcane. Jute, a commercial fibre, though it has decreased in significance, remains a major export crop of Bangladesh. Cotton is important to the states of Central Asia and is also a major crop in India and Pakistan. Rubber was brought to Asia from Brazil in the 19th century; the major producers are Indonesia, Thailand, and Malaysia, with lesser amounts from India, China, and the Philippines. Palm oil has become important in Indonesia and Malaysia. Tea is grown on commercial plantations in the uplands of India, Sri Lanka, and Indonesia; and China, Taiwan, and Japan produce several types of tea on smallholdings. Coconuts are an important crop in the Philippines, Indonesia, India, and Sri Lanka. India, the world's leader in sugarcane production, grows primarily for domestic use, whereas the Philippines, Indonesia, and Taiwan produce for both domestic consumption and export. Tobacco is grown widely, notably in China, India, Turkey, Central Asia, Pakistan, and Indonesia. Date palms are cultivated, particularly in the Arabian Peninsula. Licorice is grown in Turkey. A large variety of spices are grown in India, Bangladesh, Sri Lanka, and Southeast Asia, particularly Indonesia.

Manufacturing of Asia

Industrial development in Asia has been remarkable since the end of World War II. Most spectacular was Japan's emergence as a global manufacturing superpower in the first postwar decades, but more recently the focus has been on countries such as South Korea, Taiwan, and Malaysia. Nonetheless, Asia's industrial output is still far less than its proportion of world population. Although heavy industry has been important to the economies of the larger Asian countries, light manufacturing has been more conspicuous. In the lesser-developed and newly industrialized countries, labour-intensive industries have remained the most important. Medium-technology industries have been significant in many Asian economies regardless of their stage of development. Unequal regional development is a political problem in large countries such as China and India. Parts of western India are developing

rapidly, while the east stagnates; similarly, China's prosperous coastal belt is outstripping inland areas.

Heavy industry and engineering

The wide variety of mineral resources in Asia provides the basis for several metallurgical industries. Some, as in Russia (Siberia), are based on local resources, while others, as with Japan's steel industry, rely on imported ores. The major producers of steel are China and Japan, respectively first and second in the world; other important steel producers in Asia are Siberia, South Korea, India, Taiwan, and Turkey. Japan, China, South Korea, India, and Taiwan are the major steel consumers, although the consumption of steel is increasing in other countries. Japan, China, and India also are the region's leading producers of metallurgical coke.

The leading primary producers of aluminum in Asia are China, Russia, India, and the Persian Gulf countries, particularly Bahrain. There is also some production of copper, zinc, lead, and tin in Asia, with China and Japan leading in the production of zinc and lead and Malaysia in the production of tin. Japan, China, and India are leading consumers of tin.

Japan produces every variety of engineering goods, from tankers and locomotives to miniaturized electronic equipment. Since World War II, India has also gradually diversified its engineering industries and now produces heavy capital goods (machines and tools used to manufacture other goods), various types of industrial machinery, prime movers (engines and other sources of motive power) and boilers, diesel engines, sewing machines, machine tools, agricultural machinery, and all types of electrical equipment. In addition, India produces radio receivers, metal manufactures, railway rolling stock, automobiles, bicycles, and precision instruments. China has also made considerable progress in the field of engineering industries. Other Asian countries have primarily concentrated on producing durable consumer goods. Manufacturing based on computer hardware, software, and information processing has grown fast in Japan, Singapore, Malaysia, Taiwan, and South Korea and has also established fast-growing enclaves in India—particularly around Bangalore and Mumbai (Bombay).

Chemicals and petrochemicals

The consumption of nitrogenous and phosphatic fertilizers has greatly increased in Asia, largely because additional countries have begun to use the advanced techniques and improved seeds that have become available. The major consumers of fertilizers, per acre of arable land, have been Japan and South Korea. Because of their vast size and the increased use of fertilizers, India and China are, in absolute terms, among the major consumers. India has greatly increased its production, especially of ammonium sulfate, and has also experimented with fertilizers that have a much higher nitrogen content, such as urea. Production of phosphatic fertilizers has also been increased in Asia, especially in Indonesia.

While Asia's main sources of natural gas and crude oil lie in the Persian Gulf region, western Siberia and Central Asia, China, Malaysia, and Indonesia, the continent's petrochemical industry is more widely distributed, with especially heavy concentrations in countries with skilled workforces and strong domestic demand for petrochemical products. Thus, the leading centres of petrochemical manufacturing in Asia are Japan, China, and Siberia. Saudi Arabia, the world's leading crude oil producer, refines only slightly more petroleum than South Korea, which, like Japan, has to import nearly all of its crude oil and natural gas. Other countries with significant petrochemical industries are India, Iran, Indonesia, Singapore, the smaller Persian Gulf countries, Azerbaijan, and Turkmenistan.

Asia also produces and consumes common chemicals such as caustic soda, soda ash, and sulfuric acid; Japan and China are the leading producers of these, followed by India.

Textiles and other light manufacturing

The textile industries, particularly cotton, have expanded greatly in Asia since World War II. China (including Hong Kong) is the world's largest exporter of cotton textiles. Pakistan is another major exporter, while Japan, India, South Korea, Turkey, and Bangladesh also are prominent in the international market. The industry produces cotton yarn, cloth, and finished garments. There is also some processing of wool (both yarn and woven fabrics) in

the region. China, Japan, India, and Turkey are among the main producers and consumers; China is Asia's chief producer of woolen fabrics. South Korea, Japan, and India also have become major producers of woven rayon and acetate fabrics. South Korea and Japan have turned to noncellulose synthetic fibres, especially nylon, acrylic, and polyester, as well.

Industries based on processing agricultural products—e.g., canning, food and beverage processing, and footwear manufacture—continue to be important in most Asian countries. The consumption of pulp and paper throughout the continent has grown steadily, largely because standards of living are higher. The major consumers are China, Japan, and India, and the major producers are China, Japan, Siberia, and India. Feedstock includes grasses and bamboos as well as timber.

Pharmaceutical manufacture also has become important, although its development has varied from country to country. Japan, for example, has established a pharmaceutical industry, the research and development capabilities of which are comparable to those achieved in western Europe and the United States; whereas in many of the other Asian countries pharmaceutical manufacture consists of only fabricating products from basic drugs, imported in bulk, which are then marketed for domestic consumption or for export.

Handicrafts

Traditional cottage industries and handicrafts continue to play an important role in the economies of all Asian countries. They not only constitute major manufacturing activities in themselves but are also often the only available means to provide additional employment and raise the level of living for both rural and urban populations.

In view of the growing world market for products of traditional Asian cottage industries and for Asian handicrafts, there is room for considerable expansion. During the 1990s significant improvements were made in marketing these products in wealthy countries. Some, however, have raised ethical questions about the use of child labour in some of these industries, such as carpet making in South Asia.

Energy

The per capita consumption of energy in Asia outside the oil-producing countries of the Middle East is considerably lower than the world average. China is by far the largest producer in Asia. While Japan produces about half as much, it consumes more energy than China in per capita terms. India produces slightly less energy than Japan, but, with its vast population, its per capita consumption is much lower. In China and India coal is the dominant source of energy for generating electricity, but in both countries about one-sixth of the electricity supply comes from hydroelectric sources. Kyrgyzstan and Tajikistan both largely depend on hydropower from the Pamir and Tien Shan ranges, and Sri Lanka also relies heavily on hydropower. Japan and South Korea are the only countries in Asia where a substantial portion of the electricity (about one-third) comes from nuclear power. China and India have nuclear power plants, but they contribute little to national supplies. Many countries of the Middle East have per capita energy-consumption figures considerably higher than the world average. Electricity there is generated using domestic oil and gas supplies.

Geothermal power in Asia is most developed in Siberia, with plants at Makhachkala, Lake Baikal, and Kamchatka; Uzbekistan has a plant at Tashkent; and Japan has two small plants. The only other Asian country to use geothermal power is the Philippines. Small gas-turbine generating stations also have been installed in many countries. Pakistan uses natural gas for both thermal and gas-turbine generation. Bangladesh is expanding electricity generation from domestic gas supplies.

Services

The service sector has grown markedly in Asia since the mid-20th century, and in most countries it now constitutes the most important component of the economy. Service activities account for some three-fifths or more of the gross domestic product (GDP) of economically advanced countries such as Japan, Taiwan, and Singapore and exceed half of the GDP in countries such as South Korea and Thailand. In China the service sector's proportion of the GDP jumped dramatically after the country reacquired sovereignty over Hong Kong and Macau, both with economies

that are based largely on services. Banking and other financial activities have grown significantly in importance, and Hong Kong, Tokyo, Singapore, and other major Asian cities have become integral parts of the global banking system; nearly all such cities also have stock exchanges.

Tourism has developed considerably since World War II and has been a major component in the growth of the Asian service sector. There have been increases not only in the number of non-Asian visitors but also in the number of Asian travelers within Asia. The Japanese in particular have been avid tourists in Asia, notably in Southeast Asian countries. The most-visited places include Hong Kong, Japan, Thailand, China, Singapore, India, Pakistan, Turkey, Syria, and Israel. Hong Kong and Singapore both have a large entrepôt trade and attract visitors partly because they are duty-free ports. The number of tourists visiting China has grown since that country began lifting travel restrictions in the 1970s. India and Thailand both have well-established tourist sectors, which cater to visitors not only of their historic cities and palaces but also of their coastal resorts; Thailand is also known for its sex trade. Nepal is a popular destination for trekkers in the Himalayas, while nearby Bhutan strictly rations the number of visitors it allows into the country. Parts of Indonesia, particularly Bali, have become popular with tourists from Australia and Europe, as reaching those destinations has become easier. Israel has a large and multifaceted tourist industry, while Turkey has become a major holiday resort for Europeans. Vietnam is emerging as a destination for tourists wishing to see less heavily visited countries. Siberia and Kamchatka have begun to attract travelers seeking wilderness experiences.

AGRARIAN CRISIS AND AGRICULTURAL MARKET REFORMS IN SOUTH ASIA

Setting the Context

South Asia is home to 0.5 billion multi-dimensionally poor people accounting for 29% of the total population (UNDP & OPHI, 2021). In South Asia, the agricultural sector provides employment to 42% of the workforce (Singh & Gill, 2020), a majority of whom,

both men and women, are not only poor but also indebted (Guerin, 2014; Singh et al., 2020). It is well established that productivity and wages in the agricultural sector are very low: characterized by small farm size and differentiated exchange relations for inputs and products (Aga, 2019; Rawal & Verma, 2020). While regionally and socially uneven, the agrarian crisis is severe. There is a dire need to consider and enact agriculture sector reforms that may reduce the contradictions of agrarian transformation and support its victims.

Indian economic reforms began in July 1991 with a focus on industrializing the economy for faster economic development. Agricultural reforms started slowly with pre-production and post-harvest measures (Harriss-White & Janakarajan, 2004). The experience of the last three decades has failed to answer the question of whether the economic reform programme has accelerated the structural transformation of the Indian economy. As expected, the agricultural sector's contribution to the GDP has come down significantly. However, at 44%, the workforce's dependence on agriculture continues to be high. The terms of trade have also remained mostly against agriculture, and thus, the cost of economic transformation has shifted to agriculture (Alagh, 2018). The economic reforms could not generate the dynamism to create enough formal employment opportunities to absorb excess labour from the rural workforce. NSSO survey data for 2018–19 shows most Indian farmers earning equally or more from wage-work than from producing crops or animals, confirming the multi-dimensional crisis of farming from a livelihood perspective (GoI, 2021) and exacerbating farmers' indebtedness and rates of suicide by both landowners and landless farm workers, including women. In fact, in most South Asian countries, the agricultural sectors are in a similar situation.

In India, the new round of agricultural reforms initiated by the union government in 2020 triggered farmers' protests that persisted from November 2020 for an entire year, until they were repealed. This unprecedented movement has raised questions about the nature and direction of reforms. These reforms to agricultural markets were expected to affect India's federal structure and centre–state relations, crop production and the organization of farm

activity, agricultural marketing and storage, and the public distribution system (PDS) of essential commodities. So it is of the utmost importance to examine the relations between agriculture and its markets, not only to ascertain the direction of the proposed but now repealed reforms but also to prepare the ground for alternative reforms that will help to resolve the agrarian crisis and ensure the sustainability of both agriculture and the people dependent on it.

In India, as in other South Asian countries like Pakistan, agriculture and agricultural markets are constitutionally state subjects. Despite this, India's central government has been advising constituent states on the direction of policy for agricultural markets throughout the last century (Harriss-White, 1996) but especially in the twenty-first century. In 2003, the union government designed a model Agricultural Produce Market Committee (APMC) Act, amending the APMC acts of the 1960s and 70s and providing for new market channels such as direct purchase, private wholesale markets, and contract farming. Despite the regional heterogeneity of agrarian structures, cropping patterns, exchange relations and market policies and institutions, most states amended their Acts in the light of this model. But the pace of implementation was slow. And under the macro-economic reforms, the opening of product markets to global trade has incentivized the participation of new stakeholders: wholesale cash 'n' carry players; food retail supermarkets (domestic and foreign); and online retailers/ aggregators, processors, exporters and farmer-producer companies.

New demands for assured supplies and quality of fresh (wet) agro-commodities from a diversifying agricultural production base have stressed the regulatory capacities of existing wholesale market structures (APMCs) (Singh, 2018). Despite state-mandated procurement, these markets have long been uneven in their delivery of the state-assured minimum support price (MSP) to farmers selling there. Although contracts interlocking farm product and factor markets are declining, direct 'farm-gate' sales bypassing APMC sites are both diverse and common. They range from distress transactions with itinerant bulkers to contract farming and direct purchase channels. But in many regions, traditional wholesale (APMC) markets are still considered significant for small growers

and traders, if only because the transaction costs of direct purchase of small consignments for aggregation are excessive for supermarket retailers and contracting companies.

However, in June 2020, during the peak period of the COVID-19 pandemic, with the objective of freeing farm produce markets, attracting private investment and developing new market channels like contract farming or private wholesale markets, the Union Government of India issued three agricultural market reform ordinances. Two were new ordinances covering farm produce wholesale markets and contract farming, while the third amended the Essential Commodities Act.They were rammed through parliament as Acts in September 2020 without following proper procedure and stakeholder consultations.

A range of farmers' unions, which had for some years been demanding debt-relief and minimum support price (MSP) guarantees from the Government of India, started protests against the Farm Laws (trade laws in practice [Krishnamurthy, 2021]) first in Punjab, then Haryana and later across other states. Ever since late November 2020, when the protests moved to the outskirts of Delhi and even after the loss of hundreds of lives, there have been several rounds of talks between the farmers' unions and the Union government, but without an acceptable solution until the Prime Minister of India suddenly announced to repeal the laws in November 2021. The farmers' unions had demanded the repeal of the two new laws (the Farmer Produce Trade and Commerce Act, limiting the spatial reach of APMCs and de-regulating other territory and the Contract Farming Act) and the amendment to the Essential Commodities Act (ECA), which liberalized the stocking of farm produce by processors, exporters and traders and restricted the government's power to intervene to contain prices. While the Union government defended the rationale for the new laws as beneficial for farmers and necessary for the national integration of India's agricultural markets–for a year, it only agreed to amend them where farmers' unions found them problematic (Mohan & Kamal, 2020). The three contentious Farm Acts would have had far-reaching consequences for producers, traders and consumers since they would re-regulate the agri-business sector for corporate players. The latter were promised a one nation, one

market (despite India's national market having existed for decades, if not centuries), brought about in the idiom of farmers' benefits – in terms of expanded choices of marketing channels, higher prices and market linkages.

The long-drawn-out, sustained protest has revealed the depth of India's agrarian crisis and the role of public policy—especially market regulation—in the development of the complex formal–informal system of production and distribution.

Other South Asian countries like Pakistan, Bangladesh and Sri Lanka have similar agrarian and agricultural market institutions and governance structures, including political federations.

This is therefore an opportune time to understand the nature and extent of the agrarian crisis and the potential impact of new farm laws in India on small producers and farm and allied sector workers, and to examine problems of variations in price formation, regulation, policy and practice, especially from a smallholder perspective since smallholding predominates in most South Asian countries. Such a project may help a stakeholder respond to ongoing and upcoming regulatory and policy changes affecting not only to agricultural commodities but also land and labour.

This special issue was planned given the growing discussions and debates about the nature of the agrarian crisis, while agricultural markets are expanding across South Asia. It was triggered by India's 2020 Farm Acts, the farmers' protests demanding repeal of these Acts and the demand for a legal right to a guaranteed minimum price for 23 agricultural commodities for which such minimum support prices are recommended by CACP. Not only does it examine the nature, context and implications of the proposed and now set to be repealed Farm Acts, but it also assesses the political-economic context of such reforms and the need for alternative policies and institutions for modern market channels spreading across regions and crops to protect small-holder interests and livelihoods.

The seven articles accepted for this special issue have covered a domain ranging from the agrarian crisis in India, Pakistan and Sri Lanka, through the implications of India's proposed Farm Acts and their local contexts, the rise of farmers' movements and the performance of new market channels like contract farming, to

regulative alternatives in liberalized, 'deregulated' markets where the promotion and facilitation of corporate agri-business takes preference over the protection of the interests of local, small producers.

The Roles of Markets, Agrarian Structure and Crisis in Asia

Real agricultural markets are complex sub-systems of economic activity, performing a wide range of tasks critical to the processes of social reproduction and development, including connecting producers to consumers, town to countryside and the agrarian to the non-agrarian economy. Besides, functioning on incomplete information, they operate through a great variety of institutions, shaping social classes and power relations. If agricultural markets are simply seen as channels of price information affecting allocative efficiency, two other roles are ignored. First, markets are conduits for the extraction of resources from agriculture to industry and vice versa through the terms of trade and the profits and investments made by merchants. Second, through the terms of multiple exchanges and the physically productive activities that take place in the process of commercial exchange (especially transport, processing and storage), they become arenas for the exploitation of labour as well as producers.

The neoclassical analysis of market efficiency suffers from two further limitations: first, perfect competition does not exist in actual markets; second, and more importantly, no institutionalized means are posited against which actually existing marketing systems can be evaluated. Markets exist within an institutional complex in which not only market-facilitating institutions but also non-market social and political institutions enable and sustain market exchange. Efficiency then needs re-conceptualizing within a dynamic framework which takes actually existing institutional configurations as the basis for evaluation with respect to the adaptation of market exchanges to the opportunities the institutional structure creates.

Given this framing, Harilal examined the implications of the institutions maintained by the WTO Agreement on Agriculture (AoA), regional Preferential Trading Arrangements (PTAs) and

neoliberal policies pursued by individual nations for small farmers in Asia. Globalization expands the integration of agricultural markets at local, provincial, national and global levels, whereas what the author terms the 'atomization' of farming (miniaturization of farms) occurs due to dual processes of fragmentation of holdings and weakening of collective action in which millions of small farmers, who lack any market power whatsoever, compete among themselves. For Harilal, these two forces explain the agrarian crisis in Asia.

The freedom of so-called choice provided by new policies to both farmers and buyers, leading to unfettered competition, however, does not generally address the most important question. What are the implications of market concentration and power for price discovery and income distribution? In many agricultural value chains, downstream firms enjoy the power to govern the chain by setting and imposing the rules of the transactional game. This leads to profiteering by value chain drivers to the detriment of both atomized farms (whose share of total value-added declines over time) and final consumers (when real retail prices rise). These unequal outcomes happen when competition upstream is abetted but competition downstream faces rising entry barriers. India's new Farm Acts would further such an agenda. Harilal argued that, given the limits of scale economies and the inability to build market power, both characteristic of Asian agriculture, if the agricultural sector is to be extricated from the clutches of neo-liberal globalization and atomization, then there is no alternative but for nation-states and collective agencies to come forward to support agriculture and rural livelihoods.

Kadirgama et al. (in this issue) further the argument that state withdrawal from agriculture and the growing role of private intermediaries in both input and output markets have precipitated simultaneous crises of reproduction and accumulation in rural areas of South Asia. Here, agrarian 'reforms' represent a continuation of long-running efforts to expand opportunities for profit and capital accumulation in agriculture. Rising farm input prices and unstable output prices have increased the vulnerability of South Asian farmers. They view the recent Indian attempts to deregulate and privatize markets for agricultural products as a threat to undermine the limited framework of state procurement

and output price supports in the former Green Revolution regions of North-west India.

Based on the Pakistan Kissan Ittehad (PKI)'s efforts to build a broad political coalition among differentiated agrarian producers to contest the place of farmers in agricultural markets and the Northern Sri Lankan co-operative movement's autonomous initiatives for post-war rural reconstruction, they argued that new rural movements and institutions are providing alternative visions for more equitable engagements between producers and traders in liberalized agricultural markets. PKI brought together subsistence-oriented and accumulation-oriented farmers in Punjab province so as to present itself effectively as the voice of Pakistan's 'suffering farmers' whose returns have become much more unreliable given yield and price uncertainties. While the Pakistani state provided support prices for fewer crops than neighbouring India, it quietly ceded ground to other actors, even in the so-called protected agricultural markets of wheat, cotton, rice and sugarcane. The price volatility and constant decline in the surplus generated from protected crops pushed smaller farmers into growing riskier crops such as potatoes, tomatoes and other fruits and vegetables into which larger leasehold farmers in the province had already been trapped, hedging their bets on storage facilities and export markets to be able to sell at the 'right time'. But the authors noted that the PKI continued to advocate selective market liberalization and protection for product markets while simultaneously remaining committed to demanding subsidies for farm inputs such as fertilizers, pesticides, machinery and electricity. Consequently, implementing the PKI's vision for the future of agrarian markets will lead not to an alliance of interests but rather to winners and losers amongst differentiated landowning farmers.

By contrast, in the case of Sri Lanka, when the long war ended in May 2009, farmers in the North were suddenly integrated into a liberalized national market and globalized economy, with little support and without any credible vision for the region's agrarian reconstruction. As imports plus produce from Southern Sri Lanka flowed into the Northern region, farmers faced significant competition in agricultural markets. Meanwhile, the Southern oligopoly of large rice millers locked the farmers into interlinked contracts for inputs, particularly seeds and fertilizers. Further, the

state and major donor agencies' visions for reconstruction prioritized the private sector and disregarded any role for the co-operatives.

It was with increasing attention to rural livelihoods in disarray and high levels of regional poverty that some local intellectuals and leaders of the co-operative movement began considering using the debilitated but vast infrastructure of co-operatives for rural reconstruction. Co-operatives were seen as public institutions that could be revived with grant assistance from the state. Co-operative agricultural collection centres have developed to assemble, market and distribute vegetables in urban Jaffna and the islands off the Jaffna peninsula. They proved vital for supplying vegetables to pandemic-hit communities under lockdown and to quarantine centres. The authors argued that the re-entry of co-operatives into agricultural marketing, if developed to capacity, could restrain traders currently exploiting farmers through tactics such as undue deduction as waste (10% of the produce), arbitrary pricing and non-fulfilment of contracts by supermarket chains, which have alienated farmers. In the absence of official visions for agriculture and their market systems upstream and downstream, the co-operative sector has the potential to provide inputs to farmers, enhance production, purchase produce and link producers with consumer markets. Co-operative federations are capable of absorbing risks and losses from volatile markets and thus of ensuring steady incomes for farmers.

While the spectrum of rural politics in South Asia is diverse and includes many such attempts at building new production and exchange relations, Kadirgama et al. (in this issue) argued that, even if compelled by trade deficits (as in Sri Lanka), shifts towards import substitution in agriculture can compensate for the failures of market liberalization. In India and Pakistan, strong farmers' movements, seeking to empower producers in transactions in agricultural markets, have also hindered liberalization.

Implications of India's Proposed and Repealed Farm Acts

Three articles here (Gill, Singh and Bhogal, in this issue; Kaur, Singla and Singh, in this issue) examined the implications of the

Indian agricultural market 'Farm Acts' of 2020. Gill (in this issue) drew on economic theory for the determination of prices of inputs and outputs under different market forms to raise concerns about the potential of the Farm Laws to alter the institutions of production, marketing and storage of agricultural produce involving big private corporate agencies and so to lead to changes in market institutions for price determination and output levels. He supplements this analysis with empirical evidence from the USA on the impact of similar laws on small farmers during the 1980s, comparing this with the effects of the abolition of APMC market regulation in Bihar in 2006. He questioned the official rationale for these Acts and the projection that they would enhance farmers' incomes and generate employment, such as to transform rural India. He argued that insofar as the new Farm Acts would strengthen the domination of markets by monopolistic private agri-corporates, the latter would earn abnormal profits by charging more from consumers and paying less to farmers; and the exit from agriculture of small farmers in the USA would be copied in India after the adoption of similar types of agricultural policies and laws. Since farmers receive fair prices only in a perfectly competitive market, in common, imperfect market structures such as oligopoly/ oligopsony and monopoly/monopsony, the buyers of agricultural produce can use their superior market power to pay less to the sellers/ farmers and charge more to the consumers. Gill (in this issue) proposed alternative organizational forms like co-operatives to protect farmers' interests in such markets, but he also recommended that the new farm laws be repealed.

Singh and Bhogal (in this issue) examined first the implications of the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020 (or APMC 'mandi bypass') Act for the public procurement system based upon the Minimum Support Price (MSP) and second, the rationale for farmers' demands to make the MSP a legal right of farmers. They explained the farmers' fear that due to the hidden aim of these laws to minimize the government's participation in agricultural markets in line with its adherence to neo-liberal doctrines promoting privatization and liberalization, the vital institutional and state support system (encompassing the troika of MSP and Public Procurement System

(PPS) and the APMC markets) that has been the cornerstone of agricultural development policies ever since the Green Revolution would be disabled. The private mandis permitted under the new Act would operate outside the jurisdiction of the APMC Act. The competition between the private mandis and regulated marketplaces would be unequal since, as per the new law, trade in private mandis would not be subject to fees. Consequently, business is expected to shift away from the APMC mandis, jeopardizing the latters' operations and maintenance. Given unequal regulative frames, in time, private mandis will cannibalize public mandis.

Singh and Bhogal (in this issue) further contended that even if the PPS continues after the implementation of the now proposed to be repealed Farm Acts, the possibility of late post-harvest entry by public procurement agencies cannot be discounted. Delay would automatically pave the way for private players to compensate with post-harvest price-offers lower than the MSP combined with potentially exploitative trade practices. Farmers prefer selling at APMC markets when they receive an assured price, transparent marketing conditions and safeguards against malpractices such as under-weighing. They argued that the purpose of the MSP and PPS/APMC has been to maintain food self-sufficiency and security and to ensure a reasonable assured income to farmers—conditions seriously weakened if the MSP is removed.

They also contended, however, that the MSP is currently implemented with deficiencies, such as patchy coverage, the underestimation of farming costs and the low rate of increase in the MSP, which have combined to make it ineffective as a floor price. While the Swaminathan Commission recommendations of 2006 suggested that the MSP should be 50% above the comprehensive cost of production, the MSP is currently being estimated using a formula (A2+FL) which does not include all costs (C2+FL). Further, if the MSP were estimated based on the C2 cost, as also recommended by the Ramesh Chand committee (2015), then the 2021 MSP of wheat and paddy would increase by 45% and 67%, respectively. Even the annual rates of increase in the existing MSPs have been insignificant over the years: in 2019–20, it was 2.6% for wheat and 2.9% for paddy.

Singh and Bhogal (in this issue) concluded that the 'free market' paradigm behind the Farm Laws that aim at removing the government's regulatory control on agricultural markets is one that is deeply flawed. Existing non-APMC markets across the country have failed to provide prices that meet farmers' needs due to inadequate MSPs and ineffective PPS, which together fail to lift 'open' market post-harvest prices. They suggested that an effective public procurement at the MSP of crops other than wheat and paddy could incentivize farmers to practice crop diversification, thereby reducing the area under water-guzzling crops, especially rice, which might bring further ecological benefits of water sustainability and improved soil health.

They recommended that the mal-administration of the MSP could be minimized by creating an institutional arrangement where the members of the CACP are selected not arbitrarily by the government but in consultation with the leaders of the opposition in the Lok Sabha and Rajya Sabha. The question of whether CACP should be made a constitutional body on the pattern of the Finance Commission (FC) of India needs discussion and decision. Invoking the Bihar case where the repeal of the APMC encouraged no new investment in private market infrastructure or construction and maintenance of access roads hitherto funded by APMC fees, they argued that the response to existing deficiencies in the APMC mandis cannot be privatization or dismantling of the APMC market structure.

Kaur et al. (in this issue) examined the role of contract farming in crop diversification and employment generation in the context of Indian Punjab, which has been unsuccessfully trying to move away from the water-guzzling crop of paddy. They found that contract farming helps in crop diversification and in generating employment, particularly for women, due to the high value and labour-intensive nature of crops being grown under such arrangements. To assess the impact on the cropping pattern, they used the Simpson Index and Herfindahl Index to measure the extent of crop diversification among contract and non-contract farmers. Although contract crops accounted for only about 10% of the cropped area, farms under contracts had more area under high-value crops and higher cropping intensities than their non-

contract counterparts. Contract farming, however, was not economically inclusive: the average operational land-holdings of contract farmers among potato (38.4 acres), sugar beet (24.4 acres) and chicory (25.7 acres) were roughly twice those of non-contract farmers (22.2 acres, 11.9 acres and 12.3 acres). Further, the labour intensity of crops grown on contract was much higher than that of non-contract crops. For a given crop (potato), it was higher under contract since for perishable high-value contract corps, many operations cannot be mechanized. In order to make contract farming inclusive and effective for small farmers, group contracts and contracts settled through Farmer Producer Companies (FPCs) are argued to be necessary. And, more effective regulation of contract farming practices can help leverage positive outcomes for local livelihoods.

INDIA: ISSUES AND PRIORITIES FOR AGRICULTURE

While agriculture's share in India's economy has progressively declined to less than 15% due to the high growth rates of the industrial and services sectors, the sector's importance in India's economic and social fabric goes well beyond this indicator. First, nearly three-quarters of India's families depend on rural incomes. Second, the majority of India's poor (some 770 million people or about 70 percent) are found in rural areas. And third, India's food security depends on producing cereal crops, as well as increasing its production of fruits, vegetables and milk to meet the demands of a growing population with rising incomes. To do so, a productive, competitive, diversified and sustainable agricultural sector will need to emerge at an accelerated pace.

India is a global agricultural powerhouse. It is the world's largest producer of milk, pulses, and spices, and has the world's largest cattle herd (buffaloes), as well as the largest area under wheat, rice and cotton. It is the second largest producer of rice, wheat, cotton, sugarcane, farmed fish, sheep & goat meat, fruit, vegetables and tea. The country has some 195 m ha under cultivation of which some 63 percent are rainfed (roughly 125m ha) while 37 percent are irrigated (70m ha). In addition, forests cover some 65m ha of India's land.

Challenges

Three agriculture sector challenges will be important to India's overall development and the improved welfare of its rural poor:

1. Raising agricultural productivity per unit of land: Raising productivity per unit of land will need to be the main engine of agricultural growth as virtually all cultivable land is farmed. Water resources are also limited and water for irrigation must contend with increasing industrial and urban needs. All measures to increase productivity will need exploiting, amongst them: increasing yields, diversification to higher value crops, and developing value chains to reduce marketing costs.
2. Reducing rural poverty through a socially inclusive strategy that comprises both agriculture as well as non-farm employment: Rural development must also benefit the poor, landless, women, scheduled castes and tribes. Moreover, there are strong regional disparities: the majority of India's poor are in rain-fed areas or in the Eastern Indo-Gangetic plains. Reaching such groups has not been easy. While progress has been made - the rural population classified as poor fell from nearly 40% in the early 1990s to below 30% by the mid-2000s (about a 1% fall per year) – there is a clear need for a faster reduction. Hence, poverty alleviation is a central pillar of the rural development efforts of the Government and the World Bank.
3. Ensuring that agricultural growth responds to food security needs: The sharp rise in food-grain production during India's Green Revolution of the 1970s enabled the country to achieve self-sufficiency in food-grains and stave off the threat of famine. Agricultural intensification in the 1970s to 1980s saw an increased demand for rural labor that raised rural wages and, together with declining food prices, reduced rural poverty. However agricultural growth in the 1990s and 2000s slowed down, averaging about 3.5% per annum, and cereal yields have increased by only 1.4% per annum in the 2000s. The slow-down in agricultural growth has become a major cause for concern. India's rice yields are one-third of China's and about half of those in

Vietnam and Indonesia. The same is true for most other agricultural commodities.

Policy makers will thus need to initiate and/or conclude policy actions and public programs to shift the sector away from the existing policy and institutional regime that appears to be no longer viable and build a solid foundation for a much more productive, internationally competitive, and diversified agricultural sector.

Priority Areas for Support

Enhancing agricultural productivity, competitiveness, and rural growth

Promoting new technologies and reforming agricultural research and extension: Major reform and strengthening of India's agricultural research and extension systems is one of the most important needs for agricultural growth. These services have declined over time due to chronic underfunding of infrastructure and operations, no replacement of aging researchers or broad access to state-of-the-art technologies. Research now has little to provide beyond the time-worn packages of the past. Public extension services are struggling and offer little new knowledge to farmers. There is too little connection between research and extension, or between these services and the private sector.

Improving Water Resources and Irrigation/Drainage Management: Agriculture is India's largest user of water. However, increasing competition for water between industry, domestic use and agriculture has highlighted the need to plan and manage water on a river basin and multi-sectoral basis. As urban and other demands multiply, less water is likely to be available for irrigation. Ways to radically enhance the productivity of irrigation ("more crop per drop") need to be found. Piped conveyance, better on-farm management of water, and use of more efficient delivery mechanisms such as drip irrigation are among the actions that could be taken. There is also a need to manage as opposed to exploit the use of groundwater. Incentives to pump less water such as levying electricity charges or community monitoring of use have not yet succeeded beyond sporadic initiatives. Other key priorities include: (i) modernizing Irrigation and Drainage

Departments to integrate the participation of farmers and other agencies in managing irrigation water; (ii) improving cost recovery; (iii) rationalizing public expenditures, with priority to completing schemes with the highest returns; and (iv) allocating sufficient resources for operations and maintenance for the sustainability of investments.

Facilitating agricultural diversification to higher-value commodities: Encouraging farmers todiversify to higher value commodities will be a significant factor for higher agricultural growth, particularly in rain-fed areas where poverty is high. Moreover, considerable potential exists for expanding agro-processing and building competitive value chains from producers to urban centers and export markets. While diversification initiatives should be left to farmers and entrepreneurs, the Government can, first and foremost, liberalize constraints to marketing, transport, export and processing. It can also play a small regulatory role, taking due care that this does not become an impediment.

Promoting high growth commodities: Some agricultural sub-sectors have particularly high potential for expansion, notably dairy. The livestock sector, primarily due to dairy, contributes over a quarter of agricultural GDP and is a source of income for 70% of India's rural families, mostly those who are poor and headed by women. Growth in milk production, at about 4% per annum, has been brisk, but future domestic demand is expected to grow by at least 5% per annum. Milk production is constrained, however, by the poor genetic quality of cows, inadequate nutrients, inaccessible veterinary care, and other factors. A targeted program to tackle these constraints could boost production and have good impact on poverty.

Developing markets, agricultural credit and public expenditures: India's legacy of extensive government involvement in agricultural marketing has created restrictions in internal and external trade, resulting in cumbersome and high-cost marketing and transport options for agricultural commodities. Even so, private sector investment in marketing, value chains and agro-processing is growing, but much slower than potential. While some restrictions are being lifted, considerably more needs to be done to enable

diversification and minimize consumer prices. Improving access to rural finance for farmers is another need as it remains difficult for farmers to get credit. Moreover, subsidies on power, fertilizers and irrigation have progressively come to dominate Government expenditures on the sector, and are now four times larger than investment expenditures, crowding out top priorities such as agricultural research and extension.

Poverty alleviation and community actions

While agricultural growth will, in itself, provide the base for increasing incomes, for the 170 million or so rural persons that are below the poverty line, additional measures are required to make this growth inclusive. For instance, a rural livelihoods program that empowers communities to become self-reliant has been found to be particularly effective and well-suited for scaling-up. This program promotes the formation of self-help groups, increases community savings, and promotes local initiatives to increase incomes and employment. By federating to become larger entities, these institutions of the poor gain the strength to negotiate better prices and market access for their products, and also gain the political power over local governments to provide them with better technical and social services. These self-help groups are particularly effective at reaching women and impoverished families.

Sustaining the environment and future agricultural productivity

In parts of India, the over-pumping of water for agricultural use is leading to falling groundwater levels. Conversely, water-logging is leading to the build-up of salts in the soils of some irrigated areas. In rain-fed areas on the other hand, where the majority of the rural population live, agricultural practices need adapting to reduce soil erosion and increase the absorption of rainfall. Overexploited and degrading forest land need mitigation measures. There are proven solutions to nearly all of these problems. The most comprehensive is through watershed management programs, where communities engage in land planning and adopt agricultural practices that protect soils, increase water absorption and raise productivity through higher yields and crop diversification. At issue, however, is how to scale up such initiatives

to cover larger areas of the country. Climate change must also be considered. More extreme events – droughts, floods, erratic rains – are expected and would have greatest impact in rain-fed areas. The watershed program, allied with initiatives from agricultural research and extension, may be the most suited agricultural program for promoting new varieties of crops and improved farm practices. But other thrusts, such as the livelihoods program and development of off-farm employment may also be key.

World Bank Support

With some $5.5 billion in net commitments from both IDA and IBRD, and 24 ongoing projects, the World Bank's agriculture and rural development program in India is by far the Bank's largest such program worldwide in absolute dollar terms. This figure is even higher when investments in rural development such as rural roads, rural finance and human development are included. Nonetheless, this amount is relatively small when compared with the Government's - both central and state - funding of public programs in support of agriculture. Most of the Bank's agriculture and rural development assistance is geared towards state-level support, but some also takes place at the national level.

The Bank's Agricultural and Rural Development portfolio is clustered across three broad themes with each project, generally, showing a significant integration of these themes.

Over the past five to ten years, the Bank has been supporting:

R&D in Agricultural Technology through two national level projects with pan-India implementation (the National Agriculture Technology Project and the National Agriculture Innovation Project) coordinated by the Government of India's Indian Council for Agricultural Research (ICAR).

Dissemination of Agricultural Technology: New approaches towards the dissemination of agricultural technology such as the Agriculture Technology Management Agency (ATMA) model have contributed to diversification of agricultural production in Assam and Uttar Pradesh. This extension approach is now being scaled-up across India.

Better delivery of irrigation water: World Bank support for the better delivery of irrigation water ranges from projects covering

large irrigation infrastructure to local tanks and ponds. Projects also support the strengthening of water institutions in several states (Andhra Pradesh, Karnataka, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh) improved groundwater management practices (for instance, in the upcoming Rajasthan Agriculture Competitiveness Project).

Sustainable agricultural practices through watershed and rainfed agriculture development (Karnataka, Himachal Pradesh, Uttarakhand), soil reclamation efforts (Uttar Pradesh) and, more recently, improved groundwater management practices (for instance, in the upcoming Rajasthan Agriculture Competitiveness Project).

Improved access to rural credit and greater gender involvement in rural economic activities through rural livelihood initiatives undertaken by a number of states (Andhra Pradesh, Bihar, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu) and soon to be scaled up by GOI with Bank support through a National Rural Livelihood Mission.

Agricultural insurance by advising GOI on how to improve the actuarial design and implementation of the insurance program (e.g. rating methodology and product design, index insurance, use of mobile and remote sensing technology to measure yields, etc.).

Improved farmer access to agriculture markets through policy reforms and investments under the Maharashtra Agricultural Competitiveness Project which aims to reform regulated wholesale markets and provide farmers with alternative market opportunities.

The land policy agenda through analytical work as well as non-lending technical assistance in support of GOI's National Land Records Modernization Program.

Better rural connectivity through IDA support to the Prime Minister's National Rural Roads Program (PMGSY), and by connecting rural poor and smallholder farmers through collective action to public services through Self-Help Groups (and SHG federations), Water User Associations and Farmer Producer Organizations. Recently the Bank's Board of Executive Directors approved the National Rural Livelihood Mission, which supports SHG approaches through a pan-India approach.

5

Urbanization: Levels and Pattern, Contemporary Issues

Urbanization provides South Asian countries with the potential to transform their economies to join the ranks of richer nations in both prosperity and livability, but a new World Bank report finds the region, while making strides, has struggled to make the most of the opportunity.

One big reason is that its urbanization has been messy and hidden, according to the report titled, "Leveraging Urbanization in South Asia: Managing Spatial Transformation for Prosperity and Livability." Messy urbanization is reflected in the widespread existence of slums and sprawl. Sprawl, in turn, helps give rise to hidden urbanization, particularly on the peripheries of major cities, which is not captured by official statistics. Messy and hidden urbanization is symptomatic of the failure to adequately address congestion constraints that arise from the pressure of urban populations on infrastructure, basic services, land, housing, and the environment.

South Asia's policymakers, the World Bank report says, face a choice: Continue on the same path or undertake difficult and appropriate reforms to improve the region's trajectory of development. It won't be easy but such actions are essential in making the region's cities prosperous and livable.

THE CHALLENGES OF ASIA'S URBANIZATION

To some extent, the challenges of urbanization are the same everywhere. These include enhancing economic opportunities for urban populations, improving transportation infrastructure and housing, providing social services, maintaining a liveable environment, and developing effective systems of governance and management. It is therefore possible to argue that there is nothing distinctive about the challenges posed by Asian urbanization.

Upon closer inspection, however, the process of urbanization in Asia has several distinctive features, a number of which stem from the massive size of the region's population:

- Dominance of the population giants. Unlike any other region, Asia has five less developed countries with more than 100 million people — China, India, Bangladesh, Pakistan, and Indonesia. These countries made up 75 percent of the Asian population as of mid-2001. In 2030, they will be joined by Iran, the Philippines, and Vietnam, and together these countries will constitute 81 percent of Asia's population. The combined urban population of these 8 countries will grow by more than 1 billion people in the same period, making up roughly four-fifths of the total urban increment in Asia. The dominance of the population giants in all-Asia averages is important to keep in mind since it can obscure developments in the region's numerous smaller countries.
- Immense urban increments. The sheer size of some Asian populations forces governments to cope with a large volume of urban increase in a very short period of time. The urban populations of both China and India, for example, will grow by more than 340 million by 2030. This creates tremendous challenges in the provision of infrastructure, environmental management, and employment.
- Even a small country such as Laos (5.3 million in 2000), one of the poorest countries in the world, will add 3.2 million to its urban population while it moves to a level of only 43 percent urbanized in 2030. This will be more than 60 percent of the country's total population increase

in that period. Given its very low national income and the continuing high proportion of people in rural areas, it will be very difficult to give strategic priority to urban development, even in the capital city of Vientiane.

- The prominence of megacities. By 2015, 16 of the world's 24 megacities (cities with more than 10 million people) will be located in Asia, according to the UN's World Urbanization Prospects: The 1999 Revision. Most of these megacities will be located in the population giants. While most urbanites both in Asia and elsewhere will continue to live in smaller towns and cities, the urban hierarchy of Asia will be dominated by the emergence of these larger cities. Urban development will often stretch in corridors between the main city core and secondary cities, much like the megalopolis of the eastern United States.
- Uneven globalization. For the past two decades, Asia has surpassed the rest of the less developed world in terms of integration into the global economy, creating greater opportunities for urban development. This development has proceeded unevenly, however, and a two-tier urban system is likely to emerge in Asia as a result. Some urban areas will be increasingly integrated into the global economy and become more international in character. These towns and cities — such as Seoul, Singapore, Taipei, and Shanghai — will have to manage the challenges and opportunities that come with rapid economic growth and change. On the other hand, there will also be cities with more domestically oriented economies that develop more slowly. These urban places will face greater challenges in terms of poverty and creating opportunities for economic growth. Cities such as Dhaka, Phnom Penh, and Vientiane exemplify this group.

A Tale of Two Cities: Seoul and Dhaka

The two-tier structure of Asian urbanization described above can be illustrated by comparing two of the region's largest cities, Seoul and Dhaka.

The Seoul Metropolitan Region: Planning with Growth

The city of Seoul, with a population of 10.3 million in 1998, forms part of South Korea's capital region, which includes the city of Inchon as well as Kyonggi province. Including Seoul, this region had a population of 20.7 million in 1998. As the capital city, Seoul has been at the center of South Korea's remarkable economic transformation over the last four decades. In 1961, the national population stood at 24.6 million, per capita income was US$83, and primary production made up 37 percent of GNP. By 1990, the population had almost doubled to 46 million and the contribution of the primary sector to GNP had fallen to 10 percent. The national level of urbanization had risen from 28 to 75 percent. Much of this societal change was due to the growth of industry, which increased its share of GDP from 20 percent in 1960 to 44 percent in 1990.

In the 1960s, much of South Korea's industrial growth was focused on greater Seoul, which by 1970 had 52 percent of the country's industrial workers. The major contributor to this growth was rural-urban migration, which accounted for 50 percent of the country's urban increment in the 1960s. This very rapid growth of Seoul's population placed pressure on the city's infrastructure, leading to marked growth in squatter settlements, increasing traffic congestion, and growing air pollution. This led the government to adopt a national decentralization strategy in the 1970s that attempted to divert industry to other areas of the country. New industrial complexes were established in the southeast part of the country. In the 1980s, continuing efforts were made to decentralize economic activity, and ambitious investments in Seoul's infrastructure and public and quasi-public housing were made before the 1988 Seoul Olympics.

In the late 1980s and 1990s, Seoul continued to lose industrial employment and increase its employment in the service sector. For example, 44 of South Korea's top 50 firms by sales have their headquarters in Seoul. The upshot of this trend has been declining population in the Seoul area. In addition, due in part to the city's success in hosting the Olympics, Seoul has embarked on an ambitious effort to become a global city with the addition of a new airport and greatly enlarged subway system. Today, Seoul ranks number 13 out of 44 in the Asia Urban Quality of Life Index

prepared annually by Asiaweek magazine. In short, while Seoul still has many problems, the government has responded very successfully to the urban challenges that will face many other Asian countries over the next thirty years.

Dhaka, Bangladesh: Ongoing Urban Poverty

Dhaka's population of 6.5 million is crowded into 360 square kilometers, creating one of the highest urban densities in the world. The city proper also forms part of the Capital Development Authority that administers an area of 1530 square kilometres, an area that is home to an estimated 10 million people. Unlike South Korea, Bangladesh has not experienced rapid economic change, and agriculture remains the major component of GDP and the main source of employment. While general economic conditions have improved somewhat over the last twenty years, Bangladesh is still a very poor country. In 2001, gross national income (adjusted for purchasing power parity) stood at US$1,530 per capita — far below the average for Asia as a whole (US$3,930) and even below the average for Africa (US$1,790). And while estimates vary, most analysts place the current incidence of poverty in both rural and urban areas at between one-third to one-half of the population.

Dhaka's rate of population growth has declined slightly over the past three decades, but it still remains among the highest in Asia (4.2 percent annually). The continuing growth reflects ongoing migration from rural areas to the Dhaka urban region. Such growth accounted for roughly 60 percent of the city's growth in the 1960s and 1970s, but more recently the city's population has also grown as a result of the expansion of its administrative boundaries, a process that added 1 million people to the city in the 1980s. In contrast, the rate of natural increase (i.e., growth due to births exceeding deaths) in the city has been falling, as is the case in most other Asian cities.

Dhaka's growth has not been associated with an expansion of productive employment opportunities in relatively high wage areas. Instead, there has been growing employment in the low productivity, low-income sector, such as petty retailing or rickshaw driving. This has meant that the number of people defined as poor in the city grew by almost 2 million between 1980 and 2001. While in recent years the introduction of textile export industries and

remittances from international labor have begun to diversify the economic base of the city, it still remains desperately poor.

Sustainable Development and Cities

The preceding examples offer two extremes of the types of policy challenges faced by the emerging megalopolises of Asia. In cities that are rapidly developing — like Seoul — many of the environmental, transportation, and liveability issues are being addressed. The central policy issues in such cities stem principally from managing growth and mitigating the adverse side effects of economic expansion, particularly in the environmental sphere. At the same time, it should still be stressed that there are still sizeable numbers of poor residents who need help in such cities.

In contrast, the health and livelihood of residents of low-income cities such as Dhaka are undermined by fragile social infrastructures, lack of opportunity, and a marked vulnerability to disease and environmental disaster. In these cases, the major needs are to create a city in which basic needs can be satisfied and opportunity created. Economic, educational, environmental, and health policies have to be directed to the alleviation of these problems.

The urban transition now underway in Asia involves a volume of population much larger than any other region in the world and is taking place on a scale unprecedented in human history. In light of these facts, there are numerous policy implications that need to be considered, all of which involve improving the effectiveness of urban management. The development of effective policies should include the following:

- Creating effective urban databases that enable ongoing monitoring and assessment of city performance.
- Re-evaluating the relationships between national and city governments as urbanization proceeds. For example, decentralization programmes introduced in the Philippines in 1992 have led to fiscal control being transferred to local governments and created many successful local initiatives.
- Providing more low-income housing units, improved transportation systems, clean water and sanitation, and social services.

- Encouraging the participation of civil society in urban governance. For example, the creation of an adequate infrastructure for the cities of Asia will require the investment of trillions of dollars over the next twenty years, a portion of which will have to come from the private sector. To be effective, this process needs input not only from the private sector and local urban governments but also from citizens groups working at the street level as well as national governments and international aid agencies.
- Developing and enforcing environmental standards. This, too, can involve civil society: One important aspect of urbanization in Asia today is the emergence of community-based organizations in poor areas that develop effective local responses to environmental degradation. These organizations are often supported by networks of NGOs that extend their practices to other cities. City governments must learn to work with such groups.

This is a demanding set of challenges, and for many it seems daunting. In Asia, ad hoc approaches will not lead to the development of sustainable and liveable cities. The first steps to cope with the challenges of Asian urbanization are to recognize that urbanization is an integral part of development and give strategic priority to policies for the urban sector.

SOUTHEAST ASIA AND SUSTAINABLE URBANIZATION

WHETHER the Sanskrit *nagara*, the Roman *civitas* or whatever else be their source of historic-cultural inspiration, cities are understood to represent the highest form of sociocultural achievement in human civilization. In the past, cultural traditions and long-established political systems governed human behavior, societies and settlements in Southeast Asia. Today the region is part of an increasingly globalized world.

Evolving political processes, expanding national economies and changing environmental conditions exert strong influence on people's lives, livelihoods, lifestyles and worldview. As a sociocultural, economic and geographical collective, the region is

surging ahead as the Association of Southeast Asian Nations (ASEAN). In 2015, the region will make its final preparations to launch the ASEAN Economic Community (AEC).

It is against this socio-cultural and politico-economic backdrop that Southeast Asia's urbanization process has been unfolding. To national and local policy-makers within this dynamic region, the scale, pace and complexity of urbanization poses both huge challenges and unique opportunities. This essay reflects on the key policy issues and imperatives vis-Ã -vis sustainable urbanization in Southeast Asia, and discusses some of the significant challenges and opportunities related to urban demographic expansion and sub-national development. I also explore cities, economic growth and employment; urban poverty, inequality and informal settlements; urban infrastructure, environment and climate change; city development strategies, and urban and regional planning; and urban governance and finance.

EXPANSION AND DEVELOPMENT

Southeast Asian cities comprise 47 percent of the region's population, with national urbanization rates ranging from a low of 20 percent in Cambodia to 53 percent in Indonesia and 100 percent in Singapore (according to United Nations data released in July). With a large urban demographic base of 294 million people, Southeast Asia is urbanizing rapidly. Compared to the Asia-Pacific's average annual growth of 2.7 percent in the 1990s, Southeast Asia's urban population grew at 3.6 percent annually during the same period. While urban demographic expansion slowed after 2000, average annual growth in the past decade was still 2.6 percent. Estimates show that Southeast Asia will reach 50 percent urbanization by 2019, when 36 million additional inhabitants will bring its urban population to 330 million.

There are some unique defining features of urbanization in Southeast Asia, and two of them require policy attention at national and subnational levels. First, the region's cities are in a constant process of growth and change. Between 1950 and 2014, the region's urban population increased 11-fold from 26 million to 294 million. Since 1990, Southeast Asian cities have added 154 million

inhabitants — more than the combined populations of Brunei, Cambodia, Malaysia, Laos and the Philippines. There is no historical or Western parallel to such a massive demographic shift toward urban areas. The pace of urban demographic expansion is expected to slow in the coming decades, but policy-makers will remain hard pressed to find innovative solutions to steer this complex phenomenon.

Second, despite the presence of many metropolitan cities, Southeast Asia's urbanization is broad-based. In 2010, 73 percent of the region's urban population lived in small cities (below 500,000 inhabitants) and medium-sized cities (500,000 to one million inhabitants). This is not going to change significantly until 2030 when more than two-thirds of the region's urban population will live in small and medium-sized cities (61 percent and 5.5 percent, respectively). Metropolitan cities (with one million to 10 million inhabitants) are home to 22 percent of Southeast Asia's urban population, and their share of urban population will marginally decline to 20 percent by the end of the next decade.

The region has only two megacities, Manila, which has 11.8 million people, and Jakarta, which has 10 million. The share of urban populations living in the region's megacities will increase to 13 percent by 2030, when Bangkok and Ho Chi Minh City will attain megacity status. Such broad-based urbanization requires policies and strategies that promote and support balanced sub-national development. Taking a long-term perspective (2030 and beyond) can help in the preparation and implementation of long-term policies and investment programs. It goes without saying that such policies should consider past urban and regional development trends within countries, and be directed to correct spatial-economic development anomalies.

CITIES, ECONOMIC GROWTH AND JOBS

A competitive economic region needs productive and competitive cities. Southeast Asian cities are highly productive. The 47 percent of Southeast Asia's population that live in urban areas produce 80 percent of its economic output. Between 1990 and 2012, the region's gross domestic product tripled from $444 million to $1.3 billion. Despite the Asian economic crisis of 1997-

1998, and the global financial crisis of 2008-2009, the region bounced back, demonstrating its economic resilience. As a result, Southeast Asia recorded an average annual economic growth rate of 4.6 percent in the 1990s and 5.4 percent during the following decade. Since 2011, the region's average annual economic growth has hovered at 5.2 percent, further indicating its continued economic dynamism. All of this underlines the strengths of city-led national economies in the region.

Cities have played a transformative role in Southeast Asia's economic growth story. In doing so, they have capitalized on the opportunities provided by the forces of globalization, export-led growth and their own demographic expansion. Other key drivers of the region's urban economies include growing domestic demand; connectivity to domestic and international markets, given its predominantly maritime geography; improving business practices; improved infrastructure and services; and investment into and competition among cities. These cities act as engines of economic growth, even though they are not always recognized as such. While it is important to underscore the cities' economic roles, the contribution of rural areas to subnational and national development cannot be underestimated.

In growing economies, urbanization often comes with a shift in employment from primary to secondary and tertiary sectors, which is confirmed by the Southeast Asian experience. Between 1991 and 2012, primary-sector employment (agriculture and others) declined from 58 percent to 41 percent, while secondary-sector employment rose from 14 percent to 19 percent, and tertiary-sector from 28 percent to 40 percent. However, there is a concern about job quality, reflected by vulnerable (or informal) employment and low wages. Between 1991 and 2012, the share of vulnerable employment within total employment in the region declined from 68 percent to 61 percent, but it remains a policy concern.

In 2012, the working poverty rate, or the proportion of Southeast Asian workers earning too little to lift their families above the $2 a day poverty line, was 32 percent. Some countries are addressing the challenges of "poor job quality" through various policy tools including financial support to small enterprises in Indonesia, training programs targeting low-wage workers in

Singapore, raising minimum wages in Thailand and strengthening vocational training in Vietnam. The region needs more such initiatives to tackle informal employment.

POVERTY, INEQUALITY AND SLUMS

Southeast Asia's economic growth has helped reduce income poverty. Between 1990 and 2011, the proportion of the region's population living on less than $1.25 a day declined more than threefold down to 13 percent. While this constitutes enormous progress, 81 million people in the region still live below the income threshold of $1.25 a day, according to 2011 data. However, the situation is quite different for urban poverty and inequality.

World Bank data on Indonesia readily illustrates the problem of urban poverty. Between 1990 and 2010, urban poverty in Indonesia declined from 48 to 13 percent compared to declines in rural poverty from 57 percent to 18 percent. Why was the reduction in urban poverty slower, in percentage point terms, than the declines in rural poverty? This reflects a wider Asia regional trend of the urbanization of poverty, and a concomitant pattern in which urban poverty declines more slowly than rural poverty. This is due to three main factors. First, although local, national and international profit-seeking enterprises drive urban economic growth, the redistributive channels that could benefit the urban poor are simply lacking in Asian cities. Second, the income required to support a household in a city is relatively higher than that in a rural area. Additional income is needed to survive in cities, as commodity prices are higher, and housing and basic services cost more than in rural areas. And third, the governments of many Asian countries have focused poverty alleviation efforts on rural areas given the fact that the majority of their populations live there, which is evident in the different outcomes. As Southeast Asia continues to urbanize, officials will need to attend to these policy deficits.

Urban income inequality can be seen to be on the rise in Indonesia, for example, thanks in part to the fact that such data is regularly collected. A similar upward trend is occurring in South Asia and Northeast Asia. Rising trends in urban inequality in Asia reflect a policy focus on economic growth and a lack of effort in confronting this problem.

Urban poverty and inequality are often spatially manifested in slums. At present, 80 million people in Southeast Asian cities live in such informal settlements, according to the United Nations Human Settlements Program (UN-Habitat). This is a major concern for policy-makers, as slum dwellers endure hardships due to their insecure land tenure; poor housing and overcrowding; and a lack of adequate basic services such as safe drinking water, sanitation, solid waste collection, education, health care, electrical power and transportation. Faced with this enormous task, Southeast Asia has made commendable progress in improving the lives of its slum dwellers. Between 1990 and 2012, the share of the region's urban population living in informal settlements declined from 49 percent to 31 percent.

According to UN-Habitat, this progress was achieved through five specific, complementary approaches: awareness and advocacy; long-term political commitment; policy reforms and institutional strengthening; proper implementation and monitoring; and scaling up successful local projects. Indonesia's Kampung Improvement Program, implemented from the late 1960s until the 1980s, is considered one of the earliest and most successful slum upgrade efforts in the world.

INFRASTRUCTURE, THE ENVIRONMENT AND CLIMATE CHANGE

Southeast Asian cities are wrestling with unique challenges related to urban infrastructure, the environment and climate change that draw attention towards three inter-related policy issues. First, due to the fast pace of economic development, the region faces the multiple challenges of poverty, environmental pollution and consumption — often related to different stages of development within a short span of time.

Urban areas lack basic infrastructure and services, such as safe water supply and sanitation. Water and soil pollution from urban economic activities threaten to bring irreversible damage to natural resources. Rising incomes have led to an explosion in private automobile and motorcycle sales, degrading urban air quality. Energy consumption in some regional cities parallels that in developed countries, while others are unable to meet even basic demand. There is no historic parallel, as industrialized nations

had the luxury of facing these challenges over a long period of time.

Furthermore, Southeast Asian cities are highly vulnerable to the impacts of climate change and natural disasters given their unique geographies and high population densities. The result is that most cities find themselves perpetually in firefighting mode. Some Asian nations have chosen the development mode of "grow first and clean later," but that will not work for all of Southeast Asia. Tackling these multifarious challenges will require policy-makers to integrate social and environmental considerations into locally suited economic development models.

There is also a mismatch between rapid urban economic growth and required investment in infrastructure and services, and environmental management. Cities have contributed to economic growth in the region and their populations have rapidly grown, but infrastructure investment has not kept pace with the demand. Only 50 percent of Southeast Asia's urbanites have access to safe drinking water supplied through piped connections, while 20 percent still lack improved sanitation facilities.

Local governments lack resources or the capacity to build wastewater treatment plants, which results in surface and groundwater pollution. In many Southeast Asian cities, up to 30 percent of solid waste is not collected regularly. Waste recycling rates vary across the region: more than 44 percent in high-income countries such as Singapore, 12 percent in its middle-income nations, only around 10 percent in the rest of ASEAN. Lack of efficient mass transit options in many cities leaves most people with little choice but to use cars or motorcycles, leading to massive traffic congestion. Emissions from transportation, industries, power plants, and residential and commercial buildings cause high levels of air pollution, which is a source of ischemic heart disease and strokes.

In March 2014, the World Health Organization said that people in low- and middle-income countries are disproportionately affected by outdoor air pollution, which causes 88 percent of the world's 3.7 million premature deaths annually, according to the WHO. The two most affected regions are the Western Pacific and Southeast Asia. It's not that Southeast Asian countries lack

environmental legislation and policies to protect natural resources and control pollution, but some are better able to enforce them than others. An urban policy refinement is needed that includes retrofitting infrastructure to underserviced areas, and building required infrastructure to match future urban growth with proper environmental safeguards.

DEVELOPMENT STRATEGIES AND PLANNING

Strategic and planning inputs vary for cities of different demographic and geographical size. Small and medium-sized cities require improved planning, management and investment in infrastructure and basic services. Competitive development strategies, efficient policy-making, urban and regional planning, and environmental management are required for fast-growing metropolitan cities. Large urban regions such as Bangkok, Jakarta and Manila not only require efficient policy-making, urban and regional planning, and environmental management, but also need to tackle issues such as multi-jurisdictional co-ordination and horizontal fiscal disparities.

While Southeast Asia confronts the complex and rapidly evolving urban challenges of the 21st century, the policy and planning tools currently in use are rooted in the early 20th century, with Singapore as the exception. Long-term urban plans fail to effectively respond to the dynamic politico-economic and socio-cultural processes that determine city growth, even though they are aided by planning tools such as zoning codes, building bylaws and planning schemes. The result of using such policy and planning tools has often been chaotic, and resulted in market-led urban expansion marred by inadequate infrastructure and services, unreliable energy systems, traffic jams and environmental pollution.

GOVERNANCE AND FINANCE

Urban governance in Southeast Asia has been traditionally dominated by national and subnational (or provincial) governments, metropolitan and other local governments, autonomous municipal corporations and the like. Rooted in the colonial past, they have tended to focus on administrative structures and processes, regulations and standards for the construction of capital works, provision of municipal services and implementation

of development programs. A shift in policy thinking has started to take place, partly in recognition of the fact that local governments lack technical and financial capacity, and partly because popular discontent grew with the state apparatus apparently failing to deliver even basic services.

From the early 1990s, many Southeast Asian countries started to implement constitutional and statutory changes to decentralize and devolve authority to local governments. This brought about two major changes. First, the broadened sphere of urban governance recognized the vital role of civil society, and second, local governments started using principles of good governance such as democratic participation and representation, accountability and transparency, and the increasing use of new technologies and e-governance. The Asian Development Bank has estimated that ASEAN's annual infrastructure needs between 2010 and 2020 will be $60 billion, not taking into account additional national projects with significant cross-border impacts such as airports, seaports and roads to borders. Local governments have come under huge fiscal pressure to maintain infrastructure investment to sustain economic growth momentum, and to meet growing demand caused by urban spatial expansion.

Due to this, local governments find themselves hard pressed to try new modes of infrastructure financing. While public-private partnerships are an alluring option for urban infrastructure development, they have been far from promising in Southeast Asia because the incentives for each party are quite different. Furthermore, many ASEAN countries, let alone their local governments, lack the regulatory and monitoring capacity to ensure fairness, transparency and effectiveness in the implementation of public-private partnerships. The cities of Southeast Asia will have to explore multiple sources of financing, including local revenue sources and domestic and foreign borrowings, if they are to meet their growing infrastructure investment needs.

FUTURE URBAN PERSPECTIVES

The nations of Southeast Asia are committed to economic integration via the ASEAN Economic Community, which will come into force by Dec. 31, 2015. Given growing regional connectivity, and confronted with the challenges and opportunities

of globalization, Southeast Asia's cities will need to both identify and strengthen their competiveness based on their comparative sociocultural, spatio-economic, geographic and environmental advantages. This will assist the formulation and implementation of competitive development strategies, locally grounded urban and regional plans and well-devised investment programs. This will contribute to ASEAN becoming a competitive economic region, and one with equitable economic development. All of this will help achieve the collective goal of competitive, inclusive, and green cities in Southeast Asia.

The quest for sustainable urbanization will require cities and city-regions to strike a delicate balance between robust economic growth and inclusive urban development and sustainable environmental management. Achieving this economic, social and environmental symbiosis will not be a one-off event but an incessant effort. It will demand innovation, testing and the application of new ideas, learning lessons and devising, refining and adapting policies to new and yet unforeseen urban economic, social and environmental conditions.

Cities have been known as the highest form of socio-cultural achievement in human civilization. To live up to such a splendid reputation, cities in Southeast Asia will need to develop a sense of balance between the old and the new, between socio-cultural conventions and evolving technological progress, and between traditional knowledge and scientific competence. In the same vein, the region will excel by upholding its historically-rooted multiculturalism, as well as by looking toward smart cities and smart societies. Sustainable urbanization in the region ought to have its own Southeast Asian essence. For the success of a grand project like this, everyone — young, old, women and men, political leaders, policy-makers, public sector, businesses, civil society, academia and media, will have to join, learn and work together.

SETTLEMENT PATTERNS

Ecological factors

Agriculture remains the mainstay of Asia, though the proportion of the population engaged in agriculture is steadily

declining. Although marginal lands in many parts of South and East Asia have been brought under cultivation, and many former pastoral ranges in Southwest and Central Asia are now irrigated, the broad ecological factors touched upon above have continued to give rise to geographic variations in population and economic activity. Parts of South and East Asia can support dense populations. Moister regions in the southwest—for example, in Turkey and northern Iran—support large populations.

In Southwest and Central Asia in general, however, agricultural productivity and population density vary markedly with the regional pattern of precipitation or the availability of water from humid highlands nearby. In the Central Asian republics the older pastoral nomadism has been transformed into organized transhumance (i.e., the seasonal migration of stock between lowlands and mountains); consequently, the families that were formerly nomadic have become permanent residents in villages, and only herders accompany the flocks and herds. Northern Asia remains a semideveloped frontier region with short-season crops growing in favoured southern localities, even though breeding of newer varieties has extended agriculture northward. The Arctic fringe is being developed on the basis of mineral resource exploitation, but only in particular localities. Siberia has remained lightly populated, with the population concentrated in scattered local centres. The agriculturally productive river plains of South Asia, China, and Southeast Asia have supported dense rural populations and large cities since the beginnings of civilization. Irrigated agriculture has provided the surplus to sustain urban elites.

Rural settlement

Population densities have everywhere increased, and the modernization of agriculture, increased mineral exploitation, and industrialization have brought cultural change. Some of the small ethnic groups have been dying out, but larger groups often have accepted change and have increased in numbers. In South and East Asia, growing lowland populations have been pressing hard on the available land as population densities exceed 2,000 persons per square mile (750 per square km). In Indonesia, government programs have encouraged farmers to relocate from Java, one of

the most densely populated places on Earth, to more thinly populated Indonesian islands, where ethnic Javanese have sometimes come into conflict with indigenous peoples.

Similarly, in Central Asia, both Chinese and Russian settlement programs have moved peoples from heavily populated regions into frontier zones in order to develop both agricultural and industrial resources. In southern Siberia the Soviet settlement program spread a thick wedge of European Russians and assorted ethnic minorities eastward to the Pacific Ocean and northward along every river valley to the Arctic Ocean. As a result, many of the Paleo-Siberian ethnic groups have been submerged and absorbed. Old trading posts, oasis towns, and the few old cities of southern Siberia and the Central Asian republics have been developed into modern industrial centres; those locations have been linked to modern transport systems by which raw materials and manufactured products flow to the European regions. Most new cities have been populated largely by European Russians, with Asian peoples remaining chiefly in the rural areas. The modernization of Southwest Asia—through the renaissance of Turkey and the impact of petroleum exploitation on the Arabian Peninsula, Iraq, and Iran—has altered many of the old patterns of ethnic groupings in those areas. A further alteration of the historic pattern came in 1948 with the creation of the State of Israel, to which large numbers of Jews from North Africa, the Middle East, Europe, and North America have migrated.

Urban settlement

More than two-fifths of all Asians live in and around cities and towns, and increasing urbanization is heightening regional contrasts in population density. Israel, Japan, and Singapore are among the most highly urbanized countries in the world, and Asia claims several of the world's largest metropolises. Two basic factors account for that concentration: natural population growth in the cities themselves and large-scale rural-to-urban migration. In many cities, such as Kolkata (Calcutta), Mumbai (Bombay), Bangkok, Jakarta, Manila, and even Shanghai, the ceaseless influx overwhelms the existing capacity to provide jobs, services, and appropriate shelter for new arrivals. The results are squatter settlements and shantytowns that may contain as many as half of

the city's people. Such areas typically lack proper water supply, electricity, sanitation, and transportation facilities, although over time the quality of the makeshift dwellings often improves.

A distinctive adaptation on a large scale, called the extended metropolis, is emerging in some areas. In such a development, the expanding peripheries of the great cities merge with the surrounding countryside and villages, where a highly commercialized and intensive form of agriculture continues yet where an increasing portion of the farmers' income is derived from nonfarm work. Some decentralization of urban industry occurs, and many new industrial and service jobs become available for the rural population. Movement of goods and people is extensive, if basic, achieved with bicycles, mopeds, carts, trucks, buses, and trains. The quasi-rural environs of urban centres offer to investors and residents alike advantages such as lower land costs, better labour markets, and less congestion and environmental pollution than exist in the cities proper. The extended metropolis model is thus an alternative form of urban growth that helps to divert what might otherwise be an overwhelming flood of migrants to the great cities. Beijing-Tianjin, Shanghai-Nanjing, Hong Kong–Guangzhou, Delhi–New Delhi, Mumbai-Pune, and Seoul are examples of a form of growth that can lead eventually to the kind of megalopolitan development found in the Tokyo-Yokohama–Ôsaka-Kôbe corridor of Japan.

6

South Asia in the Global Economy: Industry, Tourism and Trade

INDUSTRY OF SOUTHEAST ASIA

Industrialization in Southeast Asia is a relatively recent phenomenon, much of the development having occurred only since the early 1960s. As mentioned above, industrialization policies have been critical goals in the market economies of the ASEAN countries; and, in all of them except Brunei, industry's share of the GDP has grown considerably. The most significant increases have occurred in Singapore, Thailand, and the Philippines. Manufacturing in particular has accounted for the greatest changes, with Indonesia, Malaysia, and Thailand making especially large gains during the 1980s.

Small factories dominate, both in terms of the number of companies and the number of workers employed. Agricultural processing is most important in virtually all nations. The notable exception is Singapore, where the manufacture of a variety of products, headed by electrical and electronic and transport equipment, is dominant. In Thailand, Myanmar, and the Philippines, textiles and clothing are significant, as is the chemical industry in Thailand and Indonesia. Light, labour-intensive goods, such as electrical and electronic products, are increasingly

important. It is in the manufacture of these products and textiles that the most employment has been gained.

Tin is the most important metallic mineral in the region in terms of value, and Thailand, Malaysia, and Indonesia account for more than half of world production. In Malaysia and elsewhere, however, alluvial lodes are becoming depleted, and the remaining concentrations are less economical to mine. Fluctuating market prices have also discouraged tin production. Nickel, copper, and chromite are also mined, although the quantities produced in the region are minor in terms of world production. Southeast Asia has considerable reserves of oil and natural gas, notably in Indonesia, Malaysia, and Brunei.

Trade

Given Southeast Asia's strategic location and the early development of trade there, it is not surprising that trade is especially important to all nations in the region. The value of regional trade is about one-third that of the United States. Most striking is the almost total dominance of trade by the market economies. Exports, as a percentage of the GDP, are small in Cambodia, Myanmar, Vietnam, and Laos and moderately so in Thailand, the Philippines, and Indonesia. Countries with a relatively large proportion of export trade are Singapore, Malaysia, and Brunei. Composition of exports is important. In this respect, Indonesia—the trade structure of which long has been dominated by oil—has been relatively successful in diversifying its exports toward plywood, rattan, coffee, rubber, and textiles. Conversely, Malaysia, with a trade pattern of exporting palm oil, tropical hardwoods, and tin, now derives the majority of its export income from petroleum products. This revenue has been used to build up the country's industrial base. Thailand exhibits a much less diverse export structure, where food and manufactured goods account for nearly all of its total trade. Likewise, Brunei relies almost entirely on its petroleum exports. Singapore, however, has utilized its unique geographic position and highly educated labour force to attract multinational corporations. As a result, investment in the manufacturing and, increasingly, service sectors has greatly expanded.

Intraregional trade among the ASEAN members, while important, accounts for only about one-fifth of Southeast Asia's total trade. Philippine trade within the region is especially small, reflecting its long-term orientation toward the United States. Far more important, therefore, is the trade with countries outside the region, dominated by that with Japan, Europe, and the United States; increasingly significant, however, is the trade with Taiwan, China (especially Hong Kong), and South Korea.

Transportation and communications

Before World War II the various colonial powers of the region attempted to provide reliable transport systems. Emphasis first was placed on developing road networks, followed by railways. The infrastructure that was built during the colonial period, however, deteriorated rapidly after the war; since achieving independence, many of the countries gradually have been restoring and extending their road networks. This activity has been notable in Indonesia, where, because of the country's vastness, the task has been enormous. Transport systems in Myanmar and the countries of the Indochinese Peninsula in general are poorly developed, except in some parts of Vietnam, where improvements were made during wartime.

Road transport continues to be of overwhelming importance in the region. Since all countries but Laos have maritime access, water transport is next in importance. It is especially vital in archipelagic Indonesia and the Philippines and also is significant in Malaysia and Thailand. Railways are of minor importance, in part because the region's archipelagic nature is not conducive to their construction but more critically because the relatively short hauling distances allow road transport to be more competitive. Even in Thailand—where the potential for rail transport is greatest—an extensive highway system and the availability of reliable vehicles provide a formidable challenge to rail.

All of the ASEAN countries have strong domestic air transport systems. The most extensive is in Indonesia, which provides critical links between the islands. In addition, the Indonesian government maintains subsidized air services to the smaller islands. Most ASEAN nations also have international air fleets, the largest of which are maintained by Singapore, Malaysia, and Thailand.

There has been increased emphasis on the development of communications throughout the ASEAN states. Singapore has become renowned for its extensive communications infrastructure and capability. Telephone service is most abundant in the urban areas of the more developed states, although telecommunications in the rural areas of the Philippines, Indonesia, and Thailand remains deficient. Indonesia has made significant improvements in its communications infrastructure through the deployment of satellites that enhance television and telephone transmission to remote areas of the archipelago.

TRAVEL SOUTH ASIA: INDIA'S TOURISM CONNECTIVITY WITH THE REGION

Tourism is an important metric of a country's soft power potential, marked by an increase in movement of people and enabling people-to-people connectivity. Over the last two decades, South Asia has emerged as an attractive tourist destination due to its natural and cultural diversity, and price competitiveness. The region is home to tourism-based economies such as Bhutan, Maldives, Nepal, and Sri Lanka that attract high spending per traveller. In 2019, the World Economic Forum's Travel and Tourism Competitiveness Index (TTCI) ranked South Asia as "the most improved region since 2017." Within this, India has shown the greatest improvement in rank among the top 25% countries, from 40th in 2017 to 34th in 2019.

India accounts for a majority of South Asia's travel and tourism gross domestic product (GDP) and has also been the preferred destination for tourists from within the region. In the last decade, India has witnessed an increase in the share of South Asian tourist arrivals. While geographic proximity and cultural affiliations are the underlying factors for high cross-border mobility, the market size and the tourists' spending capacity have also played an important role. Additionally, tourist spill-overs from India to the rest of the region contribute significantly to the regional tourism economy.

This policy brief highlights tourism connectivity between India and its neighbours, capturing the tourism trends within South Asia. Given China's increasing tourism imports and a growing

presence in the region, the brief also offers a comparative analysis of reciprocal tourism trends between South Asia and China.

Methodology

The United Nations World Tourism Organization (UNWTO) defines tourism as "the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes." Along similar lines, the Ministry of Tourism (MoT), Government of India, defines a foreign tourist as "a person visiting India on a foreign passport, staying at least twenty-four hours in the country, the purpose of whose journey can be classified under one of the following headings: (a) leisure (recreation, holiday, health, study, religion, and support), and; (b) business, family mission, meeting." The definition extends to transit passengers who stay overnight in India and are counted as tourists.

This policy brief covers tourism data between India and seven of its neighbouring countries: Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka, which are collectively referred to as 'South Asia' or N7.

Growing share of tourist arrivals from South Asia to India

While India declared tourism as an industry in 1982, it adopted the National Tourism Policy two decades later in 2002. Supporting this, the Ministry of Tourism launched the "Incredible India" campaign in 2002 targeting increased tourist inflows. The impact of these developments is seen since 2003, when India started witnessing a linear growth in the total number of foreign tourist arrivals (FTAs). Despite this, India's share of global tourist arrivals remains abysmally low at 1.2% (2018). However, India is growing as an attractive tourist destination for travellers from the South Asian region. Tourists from the neighbourhood account for roughly a third of the total FTAs in India. In 2018, South Asia accounted for the highest percentage share of tourist arrivals (29%) among all the regions, followed by Western Europe (21%).

From 2003 to 2013, the share of South Asian tourist arrivals dipped from 23.8% to 16.9%. This declining trend registered a shift

in 2014, when the share increased for the first time in more than ten years, to 21.6%. Between 2003-2013, the cumulative annual growth rate (CAGR) of total FTAs was 10%, which increased to 22% between 2013-17. Much of this shift is attributed to the rise in the number of Bangladeshi tourists.

How tweaking rules can have a big impact: The case of Bangladesh

For years, Bangladesh has featured in India's list of top ten tourist source countries due to its proximity and cultural linkages. However, sudden surge in the number of Bangladeshi tourist arrivals from 2014. Between 2003-2014, the growth of Bangladeshi tourist arrivals was 1%, whereas, in 2014, the arrival of Bangladeshi tourists to India increased by 80%. Since then, the number been growing at an average annual rate of 40%. In 2018, one in every four tourists from South Asia arriving in India was from Bangladesh.

A possible explanation for this upward trend could be the liberalisation of Revised Travel Arrangement (RTA) between India and Bangladesh in 2013 and 2018. The 2013 revision brought certain changes to the provisions of the 1972 Agreement on Passport and Visa System, to remove difficulties faced by the nationals of either country in obtaining a visa. Some key revisions include extending the short-term visa on medical grounds for a year, allowing up to three accompanying attendants and similar extension facility, and relaxation in the issuance of multiple-entry permits. India and Bangladesh further liberalised the RTA in 2018, to include longer employment time, student visas and five-year multiple-entry permit for the elderly and freedom fighters.

In 2013 and 2018, India liberalised the Revised Travel Arrangement with Bangladesh, resulting in an average 40% year-on-year growth of tourist arrivals.

Interviews with stakeholders revealed that as a result of ease of obtaining a visa, several informal cross-border movements have been converted to formal movements. This can be exemplified by tracking movement through the formal border-crossings such as the Integrated Check Posts (ICPs) or Land Customs Stations (LCS). For example, the total incoming and outgoing passenger movement

from ICP Agartala increased by 51% in 2014-15 over the previous year, and movement through Petrapole has doubled in the last five years (2014-2019). The increase in registered movements also reflects the efficiency of border infrastructure, including digitisation of immigration processes.

A detailed 2018 survey on 'Study on Visits of Nationals of Bangladesh in India' by the Indian Institute of Tourism & Travel Management (IITTM), reveals the profile, purpose and expenditure pattern of tourists and visitors from Bangladesh. It found that while a majority of the tourists visited India for religious and leisure purpose – 37% and 26% respectively – about 14% of Bangladeshi nationals visited India for medical treatment.

Owing to the cumbersome procedure or inability to obtain a medical visa, some of them were found to have entered India through regular tourist visas. Some Bangladeshi tourists were also repeat visitors to India, with about 24% visiting India six times or more for different purposes. Furthermore, the affordability of India is an important factor for Bangladeshi tourists. The survey shows that the majority of Bangladeshi tourists spend approximately INR 8,000 (approx. USD 115) on a 5-9 day visit to India, with many dependent on public buses for transportation within India.

In the last two years, India also focused on improving visa application processes, which could further explain the rise in Bangladeshi tourist arrivals. In 2018, India inaugurated a new integrated state-of-the-art Indian Visa Application Centre (IVAC) in Dhaka – its largest visa centre in the world. Additionally, the Indian High Commissioner to Bangladesh also announced the withdrawal of the appointment system for submission of visa applications.

Visa barriers to regional tourism

India's bilateral visa policies and the resultant degree of ease of access for tourists have an instrumental bearing on the number of FTAs. Within South Asia, agreements with Nepal and Bhutan exempt all nationals of these countries from requiring a visa to travel to India and vice-versa, with only minimal exceptions. Similarly, Maldivian nationals travelling to India for tourism do

not need a prior visa if their period of stay in India is less than 90 days in the preceding six months.

We developed an openness index, tracking the ease of access to visas for nationals from South Asian countries seeking to travel to other countries in the region. The index shows that Bhutan, Maldives, and Sri Lanka have the most open tourist visa policies towards citizens of the other South Asian countries. India ranks fifth in travel openness towards South Asia, with only three countries (Nepal, Bhutan and Maldives), eligible for visa-free travel to India. By contrast, Sri Lanka offers visa-on-arrival or e-Travel Authorisation to all South Asian countries and maintains an open border with the Maldives.

Apart from serving as an indicator of the possible rise in the income profile of India's inbound tourists from South Asia – with more tourists opting for air travel – the data may also reflect improvement of India's infrastructural connectivity with its South Asian neighbours. In the last few years, there has been an increase in investments on cross-border connectivity infrastructure such as Integrated Check Posts (ICPs), airports and sea connectivity. In January 2020, for example, India and Nepal inaugurated the ICP at Jogbani-Biratnagar to facilitate trade and people's movement. This is the second ICP on the India-Nepal border – the first one was built at Raxaul-Birgunj in 2018.

Additionally, in 2018 India and Nepal agreed to open four new cross-border air routes connecting the provinces of Nepal directly to India and Bangladesh. India and Sri Lanka also expanded flight connectivity with the resumption of flights to Jaffna from Chennai after more than four decades. Interestingly, to support such air connectivity, the Ministry of Civil Aviation, India, waived the "5/20" rule, requiring five years of experience and a minimum of 20 flights for an airline to operate international flights. In March 2019, India and Bangladesh commenced a passenger cruise linking Kolkata and Dhaka as part of the Agreements for Enhancing Inland and Coastal Waterways Connectivity.

Ni Hao! South Asia welcomes Chinese tourists

Tourism is a lucrative source of foreign exchange earnings. As per the World Travel and Tourism Council's (WTTC), the sector contributed US$ 234 Billion or 6.6% to South Asia's total GDP in

2019. There was a 4.5% travel and tourism GDP growth vis-a-vis the 5% real GDP growth in the region. While foreign tourist arrivals to the region have increased over the years, there has also been a significant increase in the contribution of tourists from the two largest economies: India and China.

A comparison of Indian and Chinese tourist arrivals in four South Asian countries – Bangladesh, Maldives, Nepal and Sri Lanka – reveals that while more Indian tourists visit South Asia, the last decade has witnessed an unprecedented rise in the number of Chinese tourists, approximately by 753%. In 2007, few Chinese tourists were visiting South Asia, concentrated mainly in the Maldives and Nepal (42% and 32%, respectively). In the same year, the number of Indian tourists was significantly more in Bangladesh, Nepal, and Sri Lanka.

A decade later, the 2018 figures reflect a rather different reality, with a phenomenal rise in the number of Chinese tourists to the Maldives, Sri Lanka, and Nepal. Between 2007 and 2018, Chinese tourist arrivals rose by 687% in the Maldives, and 462% in Nepal. Sri Lanka registered the highest growth in tourist arrivals from China, from just about ten thousand in 2007 to almost two hundred and sixty thousand in 2018 (a rise of 2486%).

According to the UNWTO and the Chinese Tourism Academy, China has been the world's largest tourism source market since 2012. The number of outbound travel departures increased from 4.5 million in 2000 to 150 million in 2018, with an average annual double-digit growth of 16%. However, it is reported that the market is still in its infancy. Since only 7% of Chinese citizens currently own a passport, the number of trips could surge to over 400 million by 2030.

This enormous expansion of the Chinese outbound tourism market can be attributed to reasons such as increased air connectivity and a rising middle-class with growing disposable income. Between 1990 and 2016, the number of international air travellers has increased from just one to 52 million. Furthermore, a profile segmentation of Chinese outbound tourists shows that women and millennials (aged between 15-34 years) dominate the market with respectively 53% and 55% of the total outbound tourist share.

Between 2007 and 2018, the number of Chinese tourist arrivals has increased five-fold in Nepal, seven-fold in the Maldives, and twenty-five-fold in Sri Lanka.

Countries in South Asia reportedly gain more from tourism exports to China than India. This is reflected in the average per capita spending capacity of Chinese and Indian tourists in 2018, at approximately US$ 1850 and US$ 960, respectively. In the same year, the total Chinese tourist expenditure amounted to US$ 277 billion, registering a 5% increase from the previous year. By comparison, India's total international tourist expenditure was US$ 26 billion after a 9% year-on-year increase.

China's increasing investments in tourism and allied sectors in South Asia could have possibly led to the rise in Chinese tourist arrivals. For instance, in the Maldives, China has invested significantly in infrastructure, housing, hotels and airlines. In 2011, the Sri Lankan government sold a strategically important site, the Colombo beachfront property, to a Hong-Kong based holding company for USD 125 million. Nepal and China have established direct flights from Kathmandu to Beijing through Himalayan Airlines, a Nepal-China joint venture. Furthermore, China's Northwest Civil Aviation Construction Group, with financial assistance from the Asian Development Bank (ADB), is constructing the new Gautam Buddha International Airport. During his 2019 visit to Nepal, China's President Xi Jinping noted that "Nepal is the first South Asian country to be designated an approved destination for Chinese tourists" and that there now are about sixty weekly flights connecting both countries.

India has been the preferred short-haul destination for tourists from its neighbourhood. Tourists visit India not only for leisure and medical reasons, but also use the country for transit to other regions. Bilaterally, there have been improvements in visa policies, for example, the relaxation of the India-Bangladesh visa policy in 2013 and with the Maldives in 2019. However, there are still significant challenges towards promoting free and open intra-regional tourism such as visa-openness, gaps in cross-border infrastructure, etc. China, on the other hand, has been increasing its presence in the region, with a growth of 753% in the last decade (2007-2018). It has also made significant investments in South Asia's tourism and hospitality sectors.

Recently, the COVID-19 pandemic has presented unforeseen challenges to global tourism. With geography gaining significance and the importance of shorter distances becoming more pronounced, regional tourism is likely to grow. Governments must thus pivot to focus considerably more attention on regional tourism through investments in infrastructure and services, particularly digitisation to reduce human transactions. India, in particular, will have to leverage the wide range of cultural similarities with its neighbours such as the regional Buddhist trail and pilgrimage, etc. Such a push would also contribute locally through employment and revenue generation from foreign exchange earnings.

Policy Recommendations

Several steps can be taken to ensure a seamless flow of tourists in India and its neighbourhood:

1. E-visa, with digital application and delivery: Technical modernisation, upgradation and other improvements are needed in the Indian visa application and delivery system for South Asian nationals. Currently, only China and Sri Lanka are eligible for an Indian e-visa. Considering the rising share of tourists from the neighbourhood in India, the e-visa facility should be extended to other countries in the region.
2. Investing in digitisation in the tourism industry: Due to the Covid-19 pandemic, there is an increasing focus on digitisation of various services to revive the tourism sector. Contact-less transfers, hotel check-ins, site-visits etc. will be crucial for revival of the industry. This requires participation from both public and private sector stakeholders and significant investment in digitisation to enhance secure travel and ensure revenue from foreign exchange.
3. Inter-ministerial coordination to enhance infrastructural connectivity: The Ministry of Tourism should actively work with other ministries such as the Ministry of Civil Aviation and Ministry of Home Affairs to undertake infrastructure-related connectivity initiatives, for example by further expanding the UDAN Scheme to neighbouring countries

and supporting digital immigration services at the Integrated Check Posts. Apart from this, the government must play a role in facilitating tourism infrastructural development supported by multilaterals such as the Asian Development Bank, World Bank, Japan International Cooperation Agency, etc.

4. Tourism promotion through regional initiatives: India must take the lead in promoting intra-regional tourism through the South Asian Association for Regional Cooperation (SAARC), Bay of Bengal Initiative for Multi-sectoral, Technical and Economic Cooperation (BIMSTEC) or the Bangladesh, Bhutan, India and Nepal initiative (BBIN). Following the example of the Association of Southeast Asian Nations (ASEAN), India could host regional tourism summits and facilitate inter-regional cooperation among tour operators, for example with the Federation of ASEAN Travel Associations (FATA). India should also work and cooperate bilaterally with other South Asian countries on joint tourism promotion and advertising campaigns, towards establishing the tourism industry as a regional value chain.
5. Promoting religious tourism circuits: The historical and cultural linkages between South Asian nations offer the potential to develop tourism circuits within the region. There has been an interest towards developing a Buddhist circuit between India and Nepal, and a Ramayana circuit between India, Nepal and Sri Lanka. India's regional governments will have to play a vital role in targeted outreach initiatives to promote their religious heritage to specific countries.

PROMOTING SOUTH ASIAN TOURISM

According to the World Travel & Tourism Council (WTTC), the travel and tourism sector accounted for 10.3% of global GDP and 330 million jobs in 2019. The sector has seen high growth in the last decade, which can be largely attributed to factors such as rising disposable incomes, the emergence of low-cost carriers, etc.

While the Covid-19 pandemic has affected all sectors of the economy, the travel and tourism (T&T) sector is among those

expected to suffer the most prolonged impact. However, the pandemic provides an opportunity for India to take the lead in promoting regional tourism in South Asia. Further, there is immense potential in the travel and tourism sector, which can be harnessed to contribute to the region's economic recovery.

Challenges for Regional Tourism

- Disruption Caused by Covid-19: Tourism as an industry is built around mobility and the enabling mechanisms of consumption that are mostly intangible. The challenge posed to these factors by the Covid-19 pandemic is unparalleled in many ways.
  - o According to the World Bank estimates, South Asia's T&T sector has lost more than 10 million jobs and is further expected to incur losses of over $50 billion in GDP.
  - o This makes the countries most economically dependent on tourism, such as Bhutan, Maldives, and Sri Lanka, particularly vulnerable.
  - o Further, post-pandemic, inter-regional mobility will remain limited due to reduced air connectivity, high costs, and a lack of willingness to travel long distances.
- Informal Tourism Sector: Nearly three-fourths of the tourism sector in the South Asian region are in the informal sector.
  - o It is majorly dominated by bed & breakfast facilities, guest houses and other small-scale units.

Geo-Political Tensions: Hostile political conditions in India's neighbourhood, especially between India & Pakistan, discourages development of a South Asian regional circuit.

Opportunities For the Regional Tourism

- High Tourism Potential: Over the last two decades, South Asia has emerged as an attractive tourist destination due to its natural and cultural diversity, and price competitiveness.
  - o The region is home to tourism-based economies such as Bhutan, Maldives, Nepal, and Sri Lanka that attract high spending per traveller.

  - In 2019, the World Economic Forum's Travel and Tourism Competitiveness Index (TTCI) ranked South Asia as "the most improved region since 2017.
  - In South Asia, tourism was one of the fastest-growing sectors in the last decade, with double-digit growth leading to a contribution of $234 billion or 6.6% of the region's Gross Domestic Product (GDP) in 2019.
- Crisis Presents An Opportunity: Recently, the COVID-19 pandemic has presented unforeseen challenges to global tourism. With geography gaining significance and the importance of shorter distances becoming more pronounced, regional tourism is likely to grow.
  - Such a push would also contribute locally through employment and revenue generation from foreign exchange earnings.
- Niche Tourism: There is an opportunity that can be explored to bring back the international traveler to the niche segment of South Asian Countries, Adventure Tourism circuit with Nepal, Bhutan and Sri Lanka
  - For example: India's medical, spiritual and Ayurveda tourism, Adventure Tourism circuit with Nepal, Bhutan and Sri Lanka.
- Opportunity for India: In the last decade, India has witnessed an increase in the share of South Asian tourist arrivals. Additionally, tourist spill-overs from India to the rest of the region contribute significantly to the regional tourism economy.
  - India, in particular, should leverage geographic proximity and the wide range of cultural similarities with its neighbours such as the regional Buddhist trail and pilgrimage, etc.

Way Forward

Several steps can be taken to ensure a seamless flow of tourists in India and its neighbourhood:

- E-visa Facility: Technical modernisation, upgradation and other improvements are needed in the Indian visa application and delivery system for South Asian nationals.

  - Currently, only China and Sri Lanka are eligible for an Indian e-visa.
  - Considering the rising share of tourists from the neighbourhood in India, the e-visa facility should be extended to other countries in the region.
- Investing in Digitisation in the Tourism Industry: Due to the Covid-19 pandemic, there is an increasing focus on digitisation of various services to revive the tourism sector.
  - Contact-less transfers, hotel check-ins, site-visits etc. will be crucial for revival of the industry.
  - This requires participation from both public and private sector stakeholders and significant investment in digitisation to enhance secure travel and ensure revenue from foreign exchange.
- Inter-Ministerial Coordination to Enhance Infrastructural Connectivity: The Ministry of Tourism should actively work with other ministries such as the Ministry of Civil Aviation and Ministry of Home Affairs to undertake infrastructure-related connectivity initiatives.
  - For example by further expanding the UDAN Scheme to neighbouring countries and supporting digital immigration services at the Integrated Check Posts.
  - Apart from this, the government must play a role in facilitating tourism infrastructural development supported by multilaterals such as the Asian Development Bank, World Bank, Japan International Cooperation Agency, etc.
- Tourism Promotion Through Regional Initiatives: India must take the lead in promoting intra-regional tourism through the South Asian Association for Regional Cooperation (SAARC), Bay of Bengal Initiative for Multi-sectoral, Technical and Economic Cooperation (BIMSTEC) or the Bangladesh, Bhutan, India and Nepal initiative (BBIN).
  - Following the example of the Association of Southeast Asian Nations (ASEAN), India could host regional tourism summits and facilitate inter-regional cooperation among tour operators, for example with the Federation of ASEAN Travel Associations (FATA).

- India should also work and cooperate bilaterally with other South Asian countries on joint tourism promotion and advertising campaigns, towards establishing the tourism industry as a regional value chain.

- Promoting Religious Tourism Circuits: The historical and cultural linkages between South Asian nations offer the potential to develop religious tourism circuits within the region.
  - There has been an interest towards developing a Buddhist circuit between India and Nepal, and a Ramayana circuit between India, Nepal and Sri Lanka.
  - India's regional governments will have to play a vital role in targeted outreach initiatives to promote their religious heritage to specific countries.

INDIA'S LIMITED TRADE CONNECTIVITY WITH SOUTH ASIA

Despite geographical proximity and the existence of bilateral and multilateral free trade agreements (FTAs), South Asia is one of the least economically integrated regions in the world. Owing to protectionist policies, high logistics cost, lack of political will and a broader trust deficit, intra-regional trade in South Asia remains well below its potential at 5% of the region's global trade. This makes South Asia one of the most disconnected regions in the world, especially when compared with other regions such as East Asia and the Pacific, where intra-regional trade accounts for approximately 50% of total trade, and Sub-Saharan Africa, where intra-regional trade has improved over the years to 22% due to the steps taken by governments to create transparent mechanisms for trade facilitation. Intra-regional trade in the South Asian region (including Myanmar) amounts to only 5.6% (2017).

Enhancing intra-regional trade is necessary to increase connectivity in the South Asian region. Facilitated by the flow of goods, services, people, and knowledge, such an initiative would provide access to new markets as well as attract foreign direct investment (FDI) in diverse sectors. The ensuing economic growth would also play a key role in bridging the trust deficit in the region and raise the opportunity cost of conflict.

This policy brief maps the trends in India's trade with its neighbours to ascertain the current status of trade connectivity. A comparison with China has also been made considering its increasing presence in the neighbourhood since 2005. Based on the analysis, the brief concludes with policy recommendations to foster better intra-regional trade.

Methodology

This policy brief analyses the share of India's trade with its neighbours. The data used is from World Bank's World Integrated Trade Solution (WITS) database and the International Monetary Fund's (IMF) Direction of Trade Statistics (DOTS) database. All trade values are in United States dollars (US$). For India's trade with South Asia, the import and export volumes and shares analysed are from 1988 to 2018; the figures for China's trade with South Asia (excluding India), however, are from 1992 to 2018.

This policy brief analyses trade data for India's and China's trade with Afghanistan, Bangladesh, Bhutan, Maldives, Myanmar, Nepal, Pakistan, and Sri Lanka, collectively referred to as 'South Asia' or N8.

Trade Agreements and India's Economic Connectivity with South Asia

India's exports account for the bulk of its trade with its neighbours. The country's regional trade growth from 1991 until 1999 was minimal. In 2008, India's trade with the N8 neighbours reached a decadal high of US$13.45 billion. Following a dip in 2009, due to the global financial crisis, India's trade with its neighbours doubled in the next five years, reaching US$24.69 billion in 2014. The slowdown in India's exports to South Asia in 2015 and 2016 coincided with the 13% decline in India's global trade from US$19 trillion in 2014 to US$16.5 trillion in 2015. Intra-regional trade revived in 2017, reaching its peak at US$24.75 billion, picking up further in 2018 when it rose to US$36 billion.

India's largest export market in the region is Bangladesh, followed by Sri Lanka and Nepal, whereas the largest imports by value come from Myanmar, Sri Lanka and Bangladesh. All countries in the neighbourhood have a trade deficit with India,

the highest being Bangladesh with a deficit of US$7.6 billion, followed by Nepal at US$6.8 billion (2018). The trade deficit has been increasing.

India's trade with its neighbourhood has ranged between 1.7% and 3.8% of its global trade.

Despite the growing trade volume, India's trade with its neighbourhood has remained roughly between 1.7% and 3.8% of its global trade. Between 1988 and 1996, the country's trade share doubled as a result of an increase in trade volume and value. This could possibly be attributed to economic liberalisation in Bangladesh, India, Nepal, Pakistan, and Sri Lanka in the 1990s.

Several agreements are in place to facilitate trade in the region. The SAARC Preferential Trading Arrangement (SAPTA) was signed in 1994, followed by the South Asian Free Trade Area (SAFTA) agreement a decade later in 2004 (which came into force in 2006). India's bilateral trade with Myanmar is conducted under the 1994 Indo-Myanmar Border Trade Agreement as well as the 2009 ASEAN–India Trade in Goods Agreement (AITGA). Additionally, India and Sri Lanka signed the Indo-Sri Lanka Free Trade Agreement (ISFTA) in 1998. The agreement came into force in 2000.

Despite these agreements, trade in the neighbourhood has remained far below its potential. This is exemplary of the fact that agreements by themselves are not enough to facilitate trade unless the barriers to trade are holistically addressed. The presence of para-tariffs, high logistical costs, inadequate infrastructure, and persistent informal trade, coupled with other non-tariff barriers (NTBs), are the key reasons for India's low intra-regional trade in the neighbourhood. As a result, the cost of trading in South Asia remains unusually high.

A lack of comparative advantage in the region also inhibits the prospects of increasing regional trade as envisioned under SAFTA. Specialisation and value chains are key factors of international trade. Countries with different comparative advantages and product specialisation would have more opportunities to mutually benefit from trade than countries with a high degree of similar products and specialisation. In South Asia, most countries in the region are competitors in their export

markets in a narrow range of products, namely textile and apparel exports. India's major imports are mainly in semi-manufactured items (a consequence of the country's import policies) for which the neighbouring countries don't show any comparative advantage.

China: A Rising Economic Partner in the Region

Until 2005, India and China were close in their overall trade volume with South Asia. However, after 2005, China consistently increased its trade with South Asia, barring a slight dip in 2009 due to the global financial crisis. In 2014, China's trade reached a high of US$60.41 billion, whereas India traded approximately one-third of the amount at US$24.70 billion. Following the peak in 2014, both countries saw a decline in trade with South Asia in 2015 and 2016.

Defying the logic of proximity, most of India's neighbours are now largely reliant on China for their imports.

China's strong economic ties with Pakistan as opposed to India's minimal formal trade with its western neighbour increases the gap in both countries' trade volumes. Though China's trade volume is consistently larger, excluding Pakistan reduces the gap to almost half. This gap is attributed to the China–Pakistan Free Trade Agreement (CPFTA) signed in 2006, that increased trade significantly between both countries. The corresponding gap between India's trade with the region is much less because Pakistan's formal trade share is relatively smaller. Barring Pakistan, the gap between India's and China's trade with South Asia (N7) in 2018 is relatively lower at US$ 12.87 Billion.

China's trade with the N8 neighbours is mainly export-driven, making it a top source of goods to South Asia. Despite the existence of regional and bilateral FTAs, India's trade volume with its neighbours has remained well below in value to that of China, which has only one FTA in the region.

Analysing India and China's share in the global trade of South Asian countries reveals that only the landlocked countries (Afghanistan, Bhutan, and Nepal) have a higher trade share with India when compared to China. While exports to China from the region have been minimal, imports from China have been growing since 2012 in Myanmar, and since 2014 in the Maldives, Bangladesh,

and Pakistan. In the case of Sri Lanka, there was heavy reliance on imports from India till 2013 owing to the Indo-Sri Lanka Free Trade Agreement (ISFTA) that was signed in 1998 and came into force in 2000. However, post-2013, both India and China export at par to Sri Lanka.

In the last two decades, China has established itself as a major trade partner of South Asia. Beyond Pakistan, China has made inroads into South Asia (N8) by becoming Bangladesh's top trading partner in 2015, and bolstering trade and investment with Nepal, Afghanistan, Maldives and Sri Lanka. This mainly reflects the region's strategic importance for China's Belt and Road Initiative (BRI), particularly the smaller South Asian countries.

Enhancing trade in the South Asian region is not only economically beneficial, it is also strategically important in order to integrate India with the global economy. Regional integration in South Asia requires addressing several NTBs and further reduction of the "sensitive lists" maintained by countries to ensure the effectiveness of trade agreements. Furthermore, good practices from other regions must be tailored to the South Asian context to facilitate the resolution of reported barriers to trade. For instance, Sub-Saharan Africa has addressed NTBs by way of an online mechanism that consists of national monitoring committees in each country to facilitate the resolution of reported trade barriers. For India and her neighbours, stronger political will is required to combat barriers to trade in the region, especially after the COVID-19 crisis which may result in unleashing a new wave of protectionist measures.

Policy Recommendations

South Asia's lack of regional connectivity, despite the advantages of proximity, has a long history of mistrust, conflict, and political upheaval. In addition, India's presence as "big brother" in the region has made its smaller neighbours wary to take the initiative. Moving forward, policies must focus on reducing barriers and facilitating greater connectivity in all spheres in order to build trust and counterbalance China's growing ties with India's neighbours. The potential and benefit of trade must be realised by countries in the region to ensure mutual economic gains. The

following recommendations draw on the vast literature on trade and regional integration in South Asia.

Revisiting Free Trade Agreements

The momentum for free trade of the 2000s has been largely lost with India's neighbours. Trade liberalization initiatives under the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) have been under negotiation for more than 15 years. SAFTA and the even bolder idea of a South Asian Economic Union no longer feature in New Delhi's regional focus today. India's FTA with Sri Lanka dates back 20 years, and negotiations towards an expanded Comprehensive Economic Partnership Agreement (CEPA) keep getting delayed. Given that the global agenda of multilateral trade liberalisation has stalled, India must redouble its focus on regional trade arrangements. This will require political leadership to sacrifice domestic protectionism in order to pursue long-term strategic interests of greater trade interdependence with its neighbours.

Eliminating Barriers and Other Protectionist Policies

Countries in South Asia must take steps towards elimination of para-tariffs and NTBs. Para-tariffs, which are additional tariffs levied on imports by states, are not a part of SAFTA or any other FTAs in the region. Additionally, NTBs such as import policy barriers, anti-dumping and countervailing measures, testing and certification requirements, export subsidies, and government participation have all curtailed the potential of intra-regional connectivity. Globally, the signing of the Customs Convention on the International Transport of Goods under Cover of TIR Carnets (*TIR Convention*, 1975) is a positive step towards the elimination of some NTBs and simplifying procedures. To realise South Asia's trade potential, this model should be replicated at the regional level.

Enhancing Cross-border Infrastructure

Improvements in cross-border infrastructure such as Integrated Check-Posts (ICPs), road, air and rail links are key to facilitating trade in the region. Improved infrastructure will enable greater

connectivity thereby strengthening production networks and value chains in the region. In the last decade, while various steps have been taken to upgrade infrastructure, including the upgrading of land customs stations to ICPs, the extension of rail networks such as the Agartala–Akhaura railway link (Bangladesh) and the Jogbani–Biratnagar railway line (Nepal), or the opening of the second border checkpost between India and Myanmar (Zokhawthar–Rikhawdar). Such improvements in cross-border infrastructure connectivity are the best incentives to increase intra-regional trade.

SOUTH ASIAN FREE TRADE AREA

The South Asian Free Trade Area (SAFTA) is an agreement reached on January 6, 2004, at the 12th SAARC summit in Islamabad, Pakistan. It created a free-trade area of 1.6 billion people in Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka to reduce customs duties of all traded goods to zero by the year 2016. The SAFTA agreement came into force on January 1, 2006, and is operational following the ratification of the agreement by the eight governments. SAFTA required the developing countries in South Asia (India, Pakistan and Sri Lanka) to bring their duties down to 20 percent in the first phase of the two-year period ending in 2007. In the final five-year phase ending in 2012, the 20 percent duty was reduced to zero in a series of annual cuts. The least developed countries in South Asia (Nepal, Bhutan, Bangladesh, Afghanistan and the Maldives) had an additional three years to reduce tariffs to zero. India and Pakistan ratified the treaty in 2009, whereas Afghanistan as the 8th member state of the SAARC ratified the SAFTA protocol on 4 May 2011.

Purpose of the agreement

The purpose of the SAFTA is to encourage and elevate common contract among the countries such as medium and long-term contracts. Contracts involving trade operated by states, supply and import assurance in respect of specific products etc. It involves agreement on tariff concession like national duties concession and non-tariff concession

Objective

The main objective of the agreement is to promote competition in the area and to provide equitable benefits to the countries involved. It aims to benefit the people of the countries by bringing transparency and integrity among the nations. The SAFTA was also formed in order to increase the level of trade and economic cooperation among the SAARC nations by reducing the tariff and barriers and also to provide special preference to the Least Developed Countries (LDCs) among the SAARC nations. to establish a framework for further regional cooperation. SAARC also maintain free trade agreement among membering nations.

Instruments

Following are the instruments involved in the SAFTA:

- Trade Liberalisation Programme
- Rules of origin
- Institutional Arrangements
- Consultation
- Safeguard Measures
- Any other instrument that may be agreed upon.

Trade Liberalisation Programme

According to the Trade Liberalisation Programme Contracting countries must follow the following tariff reduction schedule. There should be a fall to 20% tariff from the existing tariff by the non-Least Developing Countries and 30% reduction from the existing tariff by the Least Developing Countries. But trade liberalisation scheme is not to be applied for the sensitive list because this list is to be negotiated among the contracting countries and then to be traded. Sensitive list will involve common agreement among the contracting countries favouring the least developed contracting countries. The SAFTA Ministerial Council (SMC) will be participating to review the sensitive list in every four years with a view of reducing the list.

Sensitive list

A sensitive list is a list with every country which does not include tariff concession. Bangladesh has 1,233 products on the

sensitive list for the Least Developing countries and 1,241 for the non-Least developing countries under the SAFTA. Bangladesh will reduce the sensitive list by 246 items for the least developed countries (LDCs) and 248 for the non-LDCs. India has 25 items on the sensitive list for the LDCs and 695 for the non-LDCs. Manmohan Singh, then Indian Prime Minister, announced in September in Dhaka that he will reduce the Sensitive List by 46. Bhutan has 150 items for both the LDCs and non-LDCs and has no plan of shortening its list. Nepal has 1,257 for the LDCs and 1,295 for the non-LDCs. Nepal has reduced its list by 259 from its previous list of 1295. Now it's 1036, said joint secretary at Ministry of Commerce and Supplies. The Maldives has 681 for all seven SAFTA nations. Pakistan had 1,169 in its sensitive list but has cut its sensitive list by 20% to 936. Sri Lanka has 1,042 and Afghanistan has 1,072 items on the negative list.

Misuse of the SAFTA

Traders use the SAFTA to reroute palm oil through Nepal into India. The Solvent Extractors' Association of India (SEA), the apex body of the vegetable oil trade, has called upon the government to look for ways to end indirect sourcing of palm oil and soyoil from Nepal under cover of the South Asian Free Trade Agreement (SAFTA).

This will help Malaysia reroute palm oil through Nepal to offset Indian government's move to stop imports of Malaysian palm oil after Prime Minister Mahathir Mohamad's stand against the abrogation of special status to Kashmir.

SEA has called on the government to close a loophole in the South Asian regional free-trade pact that has been used to circumvent customs duty by re-routing palm oil and soyoil imports through Nepal.

"The palmolein being imported from Nepal is of Indonesian and Malaysian origin and soybean oil is of South American origin, routed through Nepal ... for getting the duty exemption for such imports," it said in a statement.

India charges 50 per cent tax on refined palm oil and 45 per cent on refined soyoil and another 10 per cent surcharge on the duty.

Nepal imported 54,076 tonnes of palm oil from July to August and exported 35,706 tonnes to India during the period, the trade body said, citing import data.

The re-routing is leading to a monthly government revenue loss of Rs50 crore ($7 million) and also hurting refiners in the north-eastern parts of India, it added.

Palm oil accounts for nearly two-thirds of India's total edible oil imports. India buys palm oil from Indonesia and Malaysia, while soyoil is imported mainly from Argentina and Brazil. The country sources sunflower oil from Ukraine.

7

South Asia as a Region in the World System

Health and primary education and infrastructure have improved significantly in South Asia since 2007, but the latter remains the region's second weakest pillar, just after technological readiness. Investment in these areas will be vital to fully unlock economic growth. As they move up the development ladder, it will also be increasingly important for South Asian economies to establish competitiveness agendas to improve the functioning of their labour and financial markets, which have deteriorated over the last 10 years.

The region remains diverse, with a core of three heavyweight economies - India, Pakistan, and Bangladesh - surrounded by smaller ones such as Bhutan, Nepal, and Sri Lanka, each with its own peculiarities and unique development path. Since 2007, the gap between the best- and worst-performing economies in the region has increased in some of the drivers of competitiveness, mostly as a result of the deteriorating situation in Pakistan. The quality of infrastructure improves significantly (although from low levels) in India, Bangladesh, and Sri Lanka, while it stalls in Nepal and deteriorates in Pakistan.

Pakistan is also the only economy that fails to improve its macroeconomic environment and health and primary education levels, falling behind other South Asian economies. Financial market development remains poor across the entire region, as

does technological readiness; this last area improves significantly only in Bangladesh and Sri Lanka, which overtook India to become the best performer in this pillar in the region.

India leads the group of South Asian economies, climbing for the second year in a row, to 39th. Its competitiveness has improved across the board, in particular in goods market efficiency, business sophistication, and innovation. Thanks to improved monetary and fiscal policies, as well as lower oil prices, the Indian economy has stabilized and now has the highest growth among G20 countries. Recent reform efforts have concentrated on improving public institutions (up 16), opening the economy to foreign investors and international trade (up four), and increasing transparency in the financial system (up 15). Still, a lot needs to be done.

The labour market is segmented between workers protected by rigid regulations and centralized wage determination (112nd), especially in the manufacturing sector, and millions of unprotected and informal workers. The efficiency of the domestic market (81st) is hindered by fiscal regulations that allow federal states to levy different levels of value-added taxes; large, publicly owned enterprises further reduce the overall efficiency of the economy, especially in the utilities sector and the financial market, where there is growing concern about the incidence of non-performing loans. Finally, lack of infrastructure (68th) and ICT use (120th) remain bottlenecks. Improvement has been slow in recent years and further investment will be necessary, especially to connect rural areas and make sure they can equally benefit from and contribute to the country's development.

The richest economy in the region, Sri Lanka, slips three places to 71st, but has a stable score. Over the past 10 years, the country experienced tumultuous development and today needs to concentrate on those areas that are most important to trigger the efficiencies that will drive further growth: restructuring the labor market and investing in technological readiness, where it lags significantly behind countries at a similar stage of development. Macroeconomic conditions improved slightly, but continue to be fragile, as high government deficit and debt led to a precautionary agreement with the IMF early this year. Education remains Sri Lanka's main strength: in addition to high levels of health and

primary education (37th), the island reaps the benefits of early investments in higher education and training, today a comparative advantage vis-à-vis its peers and, since 2009, best performing country in the region.

The two Himalayan economies, Bhutan (97th) and Nepal (98th), both improve their positions this year, by eight places and one place, respectively. Infrastructure and connectivity are bottlenecks for both economies but, thanks to heavy investments in hydroelectric power, Bhutan can rely on a high-quality electricity supply (41st). Nepal boasts the best macroeconomic environment in the region and, after significant recent improvement, the second highest level of health and primary education.

With a stable score, Bangladesh climbs one position to 106th. Over the last decade, the country improved the level of basic education and health of its workforce, but consolidating the institutional framework and investing in the development of infrastructure will be key to placing growth onto solid foundations. Better levels of higher education and ICT readiness will be necessary to upgrade the manufacturing sector and the overall level of sophistication of the economy.

Pakistan completes the group of South Asian economies. Its upward trend of recent years continues with an advance of four places to 122nd, although its score is still below the 2007 level. The climate of instability during this period has surely weighed down the country's economic development.

INTERNATIONAL RELATIONS OF SOUTH ASIA

No other region is as dominated by a single country as South Asia is by India: India has three times the population of all of the other South Asian countries combined; it is more powerful militarily, politically, economically, and some would say culturally. Viewed in comparative perspective, South Asia's regional cooperation is very weakly institutionalized, leading to often pessimistic prognoses about the region's potential for deep economic and political integration. Moreover, South Asia is not an isolated region. During the Cold War the Great Powers played an often divisive role, and China's influence in the region is growing in significance. India's hegemony in South Asia has evoked a

range of responses from India, its neighbours and the wider world, and this option seeks to understand some of these.

Through a course of eight lectures and classes, we adopt a critical approach to some of the major theoretical paradigms in the discipline of International Relations (IR), and explore the ways in which they have shaped—and at times limited—the study of inter-state relations in South Asia since 1947. We unpack the unique historical, geographical, political, economic and demographic features of South Asia and open up a conceptual terrain for understanding key regional dynamics. We then engage with three distinctive approaches to framing and narrating events within (and beyond) the region: conflict and competition, including the enduring antagonistic (and recently nuclearized) relationship between India and Pakistan, and disputes over territory between India and Sri Lanka, Nepal and Bangladesh; cooperation, for example in respect of the riverine resources of the region, and through the regional institutional apparatus of SAARC; and the interplay of identities, both cultural and political, arising, for example, from internal secessionisms, insurgencies, and religious/ethnic disputes affecting parts of Pakistan, Bangladesh, and Sri Lanka, that spill across state boundaries.

Students will develop a critical ability to understand the theoretical assumptions that have shaped much of the production of IR scholarship on South Asia and that condition readings of events in the international politics of the region. They will develop a comparative perspective from which to understand inter-regional dynamics and the role of regional powers, an empirical foundation with which to narrate key moments in the bilateral and multilateral interactions between states in the region, and a sense of South Asia's place and significance in the broader international arena.

HOW SOUTH ASIA CAN CONTINUE AS WORLD'S FASTEST GROWING SUBREGION

Since 2014, South Asia has been the fastest growing subregion in the world, with its eight economies collectively boasting average annual growth of 7.0%. This is higher even than East Asia (6.2%), which includes China; Southeast Asia (4.9%); and the Pacific (4.7%). To carry on this impressive performance beyond the next couple

of years, though, will require reforms and investments. Strong growth in South Asia has been largely driven by the performance of Bangladesh and India, with growth averaging above 7% in the past five years.

Domestic demand in terms of consumption and investment has been strong. Major reforms such as the introduction of a goods and service tax in India and measures to make it easier to do business across the subregion have helped promote private investment. In next two years, India is expected to continue to grow above 7%, while Bangladesh's growth is around 8%.

Among the smaller economies of the subregion, economic performance has been more varied. Bhutan and Maldives grew by more than 6%, while Nepal, the second poorest nation in South Asia after Afghanistan, grew a little below 5% on average from 2014 to 2018 due to the earthquake in 2016. But buoyed by domestic demand and public infrastructure spending, these three countries are expected to grow at around 6.5% in the next two years.

Pakistan and Sri Lanka, meanwhile, have built up persistent and large current account deficits, as well as borrowing from overseas to finance infrastructure, in recent years. To meet its balance of payment needs, Sri Lanka entered an International Monetary Fund program in June 2016. Pakistan has followed suit. Subsequently, as they rein in domestic demand and continue to address macroeconomic imbalances, both countries are expected to grow below 4% in 2019 and 2020.

Afghanistan, as the poorest country in the region as well as in Asia, faces longstanding security and political uncertainties. Its economy depends on foreign aid and defense spending. It has barely topped 2% growth in the past five years. Yet, the Afghanistan government has put in place a self-reliance strategy, involving significant structural reforms, with the goal of achieving 7% growth by 2025.

Overall, there is good reason to believe South Asia's impressive economic growth performance at around 7% will continue over the next couple of years.

First, except for Afghanistan, the political situation is largely stable, with most countries having completed peaceful political transitions to newly elected governments in the past year or so.

Second, governments in the region have adopted a grand development agenda and taken reform measures to achieve it. For example, Bhutan has approved a new five-year plan, while Bangladesh's new government has promised a "highway to development." Maldives is formulating a national development plan while Nepal is working hard to attract foreign direct investment.

Third, the global environment, while slowing in major economies, is still positive for developing countries. Major risks are trade tensions and a sharper-than-expected slowdown in major economies. Yet, a slowing global economy would keep oil prices low and global financial conditions accommodative. South Asia is a major importer of oil and relies on external financing for its investment needs. Lower oil prices will help check general price levels and improve the current account in South Asia, where most countries run current account deficits.

Fourth, the infrastructure building boom seen in the region in the past decade or so will bear fruit as it continues in the coming years, boosting the region's productivity and competitiveness.

Fifth, South Asia's economic growth is largely driven by domestic demand and less affected by global economic developments. Domestic demand is expected to remain strong due to the large development and investment needs. Maldives is an exception and relies on tourism. A fast-expanding middle class in the region will also support consumption.

Despite these encouraging prospects, South Asia must not be complacent. To sustain strong growth, the countries of the subregion need to continue to implement announced reform measures and launch a new wave of structural reform, particularly in land, labor, and capital markets. These are critical for removing barriers to private investment and economic diversification. Afghanistan will continue to be an outlier, with permanent peace a precondition for sustainable end inclusive economic development.

Trade and investment regimes should provide an incentive for the subregion to participate in global production networks. This is important for upgrading the region's economies at a time when the global trading system is undergoing important changes. The subregion also needs to continue to invest in infrastructure,

as there remains a huge shortfall. These moves will help unlock the huge potential of a subregion that can draw on a population of 1.8 billion – a quarter of the world – as well as vast natural resources.

The experiences of Pakistan and Sri Lanka confirm the importance of macroeconomic stability in sustaining economic growth. South Asian countries need to watch for macroeconomic imbalances and take preemptive actions. Current account deficits are desirable. Yet, a fast-rising deficit may indicate an economy is growing above its potential and needs to take precautions.

Moreover, as the least integrated subregion in the world, South Asia can benefit from a more integrated subregional market. Integration helps expand markets beyond national boundaries and promotes more efficient resource allocation across the subregion according to the comparative advantage of each. By enhancing productivity growth, regional cooperation and integration can accelerate economic growth and boost employment.

Continued annual growth of 7% will double the size of South Asian economies in 10 years. This will help significantly reduce the poor population of more than 200 million living below the international poverty line of $1.9 per day per capita, still unfortunately the largest in the world. To maintain such a growth rate and remain the fastest growing subregion in the world, South Asia cannot afford to rest on its laurels. It will prosper only if the subregion continues economic reforms, maintains macroeconomic stability, and fosters greater cooperation and integration among neighbors.

8

Migration Trends and Issues

MIGRATION BRINGS SUBSTANTIAL BENEFITS

The potential benefits of migration in South Asia are substantial, with implications for growth, human capital, and poverty alleviation. For example, migrant workers send back substantial remittances. In South Asia, this is equivalent to between 6 to 30 percent of GDP in the region, often multiples of foreign direct investment (FDI) and official development assistance (ODA) combined. These flows boost household consumption and support macro-economic stability in countries of origin. Remittances can also play an important role in building human capital through greater spending on health, education, and more.

Temporary international labor migration plays a critical role in the jobs agenda, a key focus for the South Asia region which is still largely in the window to realize demographic dividends from its large and growing cohort of youth. Right now, South Asia faces the challenge of having to create good quality jobs to keep up with the millions of people that are projected to enter the working-age cohort every year for another generation. Despite a rapidly growing private sector in some of these economies, absorbing all these workers will remain a challenge. Overseas markets thus play an important role as a source of jobs.

In addition, it is often the migrants themselves who see the greatest improvements in their welfare. Migrating can increase their earnings – often doubling and tripling their wages. It also helps build their human capital by providing opportunity to develop new skills and enjoy greater agency and independence.

The potential benefits of migration in South Asia are substantial, with implications for growth, human capital, and poverty alleviation.

However, South Asian migrants still face myriad challenges from high costs and elevated risks to personal safety and welfare. Many of the poor in South Asia – those who could benefit the most from temporary economic migration – are unable to access overseas labor markets. The costs of international labor migration from South Asia to the most popular destinations are also among the highest in the world. The average costs of migration for migrant workers from Bangladesh, Nepal, and Pakistan are equivalent to 6-12 months of wages at the destination. High debt burdens incurred to support migration often also exacerbate the risks faced by migrants.

As the nature of global demand for workers shifts – with changes in labor market policy in current destinations and structural changes in the global economy, such as the increasing role of Industry 4.0. – these shifts may accelerate the rate of return migration and create pressures in sending countries for sustainable labor market reintegration.

HUMAN MIGRATION

Human migration is physical movement by humans from one area to another, sometimes over long distances or in large groups. The movement of populations in modern times has continued under the form of both voluntary migration within one's region, country, or beyond, and involuntary migration (which includes the slave trade, Human traffic in human beings and ethnic cleansing). People who migrate are called migrants or more specifically, emigrants, immigrants, or settlers, depending on historical setting, circumstances and perspective. The pressures of human migrations, whether as outright conquest or by slow cultural infiltration and resettlement, have affected the grand epochs in

history and in land (for example, the Decline of the Roman Empire); under the form of colonization, migration has transformed the world (such as the prehistoric and historic settlements of Australia and the Americas).

Population genetics studied in traditionally settled modern populations have opened a window into the historical patterns of migrations, a technique pioneered by Luigi Luca Cavalli-Sforza. Forced migration has been a means of social control under authoritarian regimes yet free initiative migration is a powerful factor in social adjustment and the growth of urban populations.

In December 2003, The Global Commission on International Migration (GCIM) was launched with the support of Secretary-General of the United Nations Kofi Annan and several countries, with an independent 19-member Commission, a threefold mandate and a finite life-span ending December 2005. Its report, based on regional consultation meetings with stakeholders and scientific reports from leading international migration experts, was published and presented to Kofi Annan on 5 October 2005.

DEMOGRAPHIC IMPACT OF MIGRATION

The impact of migration on population trends and structure is well known but flows have drawn most of the attention and, actually, a precise measure of flows is needed to assess the demographic impact of migration. Beyond uncertainties on the size of flows, data on stocks are also unavailable, with Singapore and Malaysia, among others, not publishing data on nonresident population. Would such data be available, comprehensive estimate of the impact of migration in a long-term perspective-answering questions like: what would be the population of the Philippines or the Cook Islands if there had been no migration since 1960 or 1970-would be purely theoretical because fertility would certainly have been different on the long-term had migration not taken place.

More simply, we shall try to consider the current impact of migration on population trends and structure from the latest censuses in Asia and the Pacific, with more attention to a few countries. Consequences of migration on population growth are well known. They include, as regards purely demographic impacts:

- Reduced population growth for emigration countries and higher growth for immigration countries-the former is usually considered favorable to developing countries;
- Changes in sex ratios according to gender differentials in migration patterns, with various directions being possible in both emigration and immigration countries-imbalances are usually considered unfavorable;
- Changes in age structures: increased dependency in emigration countries and reduced dependency in immigration countries – the former is considered unfavorable in the frame of the demographic window theory (Mason 2006, Mason 2001, Bloom, Canning 2001). Social and economic impacts are many, but the most commonly stated relate to:
- The labour force: depleted working ages and brain-drain from emigration countries and increased labour force and brain-gain in immigration countries, the former are considered unfavorable-however, migration releases tensions on the labour market;
- Family breakdowns reflected by increased headship rates for females in emigration countries and more frequent lone persons and 'not related' or 'other relatives' members of households in host countries – the direction of related effect is not well established

These major impacts of migration on population at the national level. The impact of migration at regional level is more rarely mentioned but it deserves to be considered, mostly as it involves populations of very different size, like in the case of China and India on one side and South and South-East Asia on the other. Economies have become interdependent in the frame of a well established system of regional migration. In emigration countries with labour surplus, migration is a safety valve that reduces unemployment and underemployment, while in immigration countries with labour shortages, migration supports economic growth – however labour surpluses and shortages need to be considered at sectoral level. The beneficial effect of emigration as a safety valve is limited in larger countries like China and India that can 'export' only a minor part of their unemployment and under-employment because receiving countries have not the

capacity to absorb it and need to protect their labour market through migration and work policies (Rallu, 2001). For instance, in China, rural underemployment was estimated to be well above 100 millions people and the region, not even the world economies cannot integrate such numbers of unqualified migrants. Nevertheless, the migration pressure of China in the region remains a concern for smaller South-East Asian countries, with Chinese setting up retail businesses and taking a large share of small trade. While there is a regional circulation of labour force at various levels of qualification and sectors of the labour market, there is also an extra-regional migration to Middle East or to developed countries of the Pacific rim and the West. Thailand, Myanmar, Malaysia, Indonesia, Bangladesh, Pakistan and Sri-Lanka are largely involved in intra-regional migration (as well as extra regional migration to the Middle-East). But China, India, the Philippines and Vietnam have a large part of their migration directed towards rim countries and to the West.

At intra-Pacific level, migration of Pacific islanders is quite limited with only Fiji, Cook Islands and Palau attracting immigrants: mostly through regional organizations and the University of the South Pacific for Fiji and in tourism industry and construction in the Cook Islands (mostly Fijians) and Palau (mostly Micronesians). Fiji and Palau also have Asian migrants, mostly Filipinos, on work contracts in health and tourism. However, Cook Is and Fiji are mostly emigration countries. Palau experienced increasing emigration of its youth and Asian net migration declined in 2000-2005.

Most of Pacific islanders' migration is directed towards rim countries: Australia, New-Zealand and the USAiii as well as to US and French territories but the latter rather consists in more or less closed US and French regional networks, that however include Asian migration, mostly for US territories. The mass migration from the Pacific, in the frame of preferential access to rim countries, results in important reduction of population growth in island countries.

Population Growth

The effect of migration on population growth varies greatly by countries, small countries being more affected than large

countries. In Asia, net migration remains below 2 per 1,000 and often below 1 per 1,000 in absolute values in most countries and therefore only slightly impacts on population growth. Its impact on China and India (-0.3 per 1,000 and-0.2 per 1,000) is even much lower.

The highest negative net migration rate is observed in Sri Lanka reaching close to-0.5 per cent and the highest positive net migration is observed in Singapore reaching close to 1 per cent (it was close to 2 per cent for the 1995-2000 period) – Brunei Darussalam has migration rate of 2 per 1,000. In the Pacific, net migration nearly erases the effect of natural growth in FSM, Nauru, Samoa, Tonga, or even inverses growth in Niue, Tokelau and occasionally in Cook Isv (Rallu, Ahlburg, forthcoming). In those countries net migration is frequently close or even above 2 per cent. Migration also considerably reduces population growth in RMI but it has declined recently. In Fiji, migration, mostly of Indo-Fijians but also increasingly of indigenous Fijians (with emigration rate of-1.7 per cent the former and-0.2 per cent for the latter;-1.0 percent for Fiji), reduces growth substantially and results in population decline for Indo-Fijians. Seamen migration from Kiribati had not much impact on growth as returns at end of contracts and some returns from Nauru tend to equilibrate flows. Palau had higher net migration rate in 1995-2000 (1.2 per cent) lifting total growth to 2.1 per cent, but it has much reduced in 2000-2005.

Sex Ratios

In the past, mostly males migrated and the analysis of sex ratios imbalances was used to reveal migration. But female participation in migration has been increasing for several decades and now many countries have higher female than male migration. Sex ratios have become difficult to interpret in regards of migration, mostly when emigration and immigration are present together. However, a few countries, like Indonesia, still have predominantly male migration and show low sex ratios at young adult ages. In the Pacific, ancient emigration countries (Tonga and Samoa) have turned to predominantly female youth migration, but mid-adult ages in Tonga show clearly imbalances in sex ratios linked with mostly male migrants in the early stage of the migration process.

Predominantly male migration to Palau steeply increases sex ratios, reaching 139 males per 100 females at ages 25-44.

Age Structures and Dependency Ratios

The depletion of young adult ages linked with migration is a major demographic impact of migration. It is associated with change in dependency ratios. However, dependency is also strongly affected by the level of fertility.

The impact of migration at young adult ages is sometimes difficult to see on agepyramids, due to past changes in fertility and various events affecting the history of countries, like conflict for Sri-Lanka. When migration affects a large range of ages like in the Philippines, the impact is not much visible. It is much clearer in Indonesia for males and Sri-Lanka for both sexes.

The depletion of young adult ages is most typical in mass migration island countries where it results in bottle neck shaped age-pyramids, like in FSM, Cook Islands and Palau. In Palau, both youth emigration of both sexes and predominantly male immigration at mid and late adult ages are well visible.

Cohort Change

A more interesting approach to the impact of migration on population consists in cohort change. While age-pyramid and sex ratios did not show much effect of migration on population structure in the Philippines, changes in cohort size at ages under 50 clearly show emigration in cohorts reaching ages 15 to 34. The impact was limited at ages 20-24 for males and 20-34 for females in 1995-2000, but it increased and extended to ages 30-34 in 2000-2005 for both sexes.

In both periods, net losses are more important for females than for males. Some return migration appears at ages 35-39, but trends thereafter are difficult to interpret as combined effects of immigration/return migration and emigration can occur. Results may also be affected by quality of age reporting or age selective variations in coverage of enumeration.

Similar data for Pacific islands show much higher net losses starting as early as late teen ages, with one third of female youth cohorts and close to 40 per cent of males 25-29 emigrating from

Samoa (and a similar situation occurs in Tonga and Cook Is), 20 per cent and 25 per cent of respectively female and male Marshallese aged 20-24, and between 15 per cent and 20 per cent of the 20-34 years old leaving Fiji, with higher rate at ages 30-34 in the frame of post-coup emigration that affected many adult Indians.

Such migration levels look like an exodus from small island countries and the situation in Sri Lanka and smaller Asian countries is intermediate between those of larger S-E Asian and small islands countries. At high levels of emigration, the impact on population structure and dependency is considerable.

Dependency ratios

The increase in dependency due to migration is the result of depleted adult cohorts. Their impact on dependency can be high and it directly affects potential for development in the frame of the theory of the demographic window of opportunity. Recent studies have shown that low dependency is favorable to economic growth (Mason 2006, Mason 2001, Bloom, Canning 2001), on condition it is accompanied by high employment level of the youth bulge, which is possible in the frame of friendly economic and investment policies as well as social and political stability and good governance. But, emigration influences dependency ratios in the wrong direction. However, emigration countries have their workers abroad sending remittances that are usually higher than what they would earn in-country.

It would need controversial reconstruction of population trends for decades with and without migration to estimate the long-term impact of migration on dependency ratiosix. Therefore, the impact of migration cannot be estimated comprehensively and precisely, but it is possible to compare dependency ratios according to countries' migration status.

In Asia, Singapore, China and Thailand have the lowest dependency and also the lowest fertility among countries Among countries that have rather similar levels of migration like Bangladesh and Indonesia, the latter has much lower dependency due to completed fertility transition while the former has still TFR above 3.

Similar characteristics and gaps prevail between the Philippines and Viet Nam, with the latter having both lower emigration and

fertility resulting in lower dependency. And despite higher migration than the Philippines, Sri Lanka has lower dependency due to completed fertility transition. Further comparison and interpretation is difficult as several host countries (Malaysia, Singapore) do not include migrants in their census reports that relates to de-jure population only. Altogether, it appears that dependency is still strongly affected by fertility levels and the related children burden and the role of migration is difficult to measure, although its impact is evident.

In the Pacific, Palau is the only country that has already achieved fertility transition (with TFR of 1.9 in 2001-2005); it also has significant immigration and consequently shows the lowest dependency ratio in the region, similar to China and Thailand. In Fiji, Indians have achieved fertility transition but they have high emigration; their dependency ratio (55 in 1996) was much above that of Palau, but still much lower than for indigenous Fijians (70) who still have TFR of 3.3 and much lesser migration All other countries, except PNG, Solomon Is and Vanuatu are more or less affected by emigration. Samoa and Tonga have TFR just above 4 since the late 1970s and the mid 1980s respectively but they have ancient and important emigration. Their dependency ratio is similar to those of Solomon Is and Vanuatu that have witnessed fertility decline much more recently with TFR still close to 5 at the end of the 20th century. Despite similar, or even more pronounced, migration patterns than Tonga and Samoa, the Cook Islands have lower dependency due to lower fertility. FSM and RMI had both recent fertility declines and important migration; they also show dependency levels close to those of Melanesian countries.

Trends show that stabilization of the size of the population in the most affected migration countries in the Pacific goes hand in hand with nearly stable dependency ratios. Only RMI, FSM and to a lesser extent Fiji and Tokelaux show significant declines in dependency that are linked with fertility declines. Other countries show stable (Tonga), fluctuating (Cook Is, Niue) or slightly increasing (Samoa, Tuvalu) dependency ratios at a rather high levels, mostly when fertility remains high with TFR around 4. However, such stable fertility levels are necessary to avoid population decline. Altogether, these countries have achieved quasi

stable populations through both quasi stable fertility and migration. As remittance based economies, achieving the demographic window does not seem to be felt as an issue in those countries. Thus, it appears that migration can erase the benefits of fertility decline for high emigration countries for a long period of time, eventually resulting in quasi stable population size and structure characterized by high dependency in the Pacific. Whenever high fertility is a major factor of high dependency in the Pacific, as well as in Asia, it appears that migration can delay the onset of the demographic window of opportunity, with most origin countries having dependency ratio well above 60 and as high as 80.

The impact of migration on labour force and gender empowerment will be addressed in relation to MDGs. The above analysis of the impact of migration on population will help us understand its impact on MDGs attainment.

MIGRATION TYPES

Migration types are not neutral on its impact on population and development. In Asia, due to lack of political agreement on long-term and permanent migration schemes, such as green cards, migration consists mostly of 'guest workers' on short-term contracts that can be extended (Asis 2005, Abella 2005). Singapore has developed medium and long-term contracts for highly qualified migrants. Chain migration patterns have developed with unskilled construction workers migrating from Myanmar to Thailand; semi-skilled Thai workers migrating to Taiwan, Singapore, while Malaysians migrate to Singapore, Korea and Japan.

Family reunification exists mostly for high qualified migrants. However, schooling of migrants' children has been addressed by several host countries including Singapore, Japan and Korea. Student and work contract migrations have consequences on age and sex of migrants. Students are youth; males migrate more often for industry jobs and women for services jobs. Age plays different roles according to types of migration as rim countries migration schemes grant points according to age. Despite forecasts of increasing shortages on labour markets in host countries (Mason), migration policies are still mostly oriented toward a restrictive selection process and temporary migration. This certainly reduces

the level of legal flows and result in higher undocumented migration the characteristics of which are less precisely known.

In the Pacific, some Polynesian countries, except Tonga, are former New Zealand colonies and benefit from special access to New Zealand: Cook Islanders, Niueans, Tokelauans are all New Zealand citizens, and Samoans benefit from a special quota. Tuvaluans and Tongans (in Polynesia) and Kiribati (in Micronesia) also have some access to New Zealand under the Pacific Access Category (PAC), as does Vanuatu (in Melanesia)i. Former US affiliated islands: FSM (Federated States of Micronesia) and RMI (Republic of the Marshall Islands) have special access to the US and to US territories (Guam and American Samoa). The special schemes have resulted in large scale migration, with free movements to New Zealand for selected groups of Polynesians, extended to Australia for New Zealand residents in the frame of the Trans-Tasman Travel Agreement, and resulting in the development of transnational communities with frequent circulation, as well as overstaying, between islands and New Zealand, further including Australia and the USii. Large scale circulation also applies to Micronesian migration towards the US. These two networks are typical of Pacific migration. Such schemes are made possible by the small size of island states and have resulted in mass migration from some island countries. But, although free movement would enable return migration and circulation, this has little developed beyond visits for Christmas and family events, and it has not resulted in much brain circulation that would enable more rapid economic development.

Labour migration has a long history in parts of the Pacific, initially for work on plantations, later for work in phosphate mines, and more recently through recruitments of seamen from Tuvalu, Kiribati and to a lesser extent, Fiji. There is also migration from Fiji to UK to work in military and to the Middle East to work as security personnel. Fiji is also largely affected by brain drain, with nurses migrating to rim countries and secondarily to Middle East. Shortages in nurses in Fiji have resulted in migration of Pilipino nurses. While Cook Islanders migrate to New Zealand, shortages in the tourism industry are filled by Fijians on short-term contracts. These are Pacific cases of chain migration.

MOVEMENT OF MIGRATION

As more and more people leave villages and farms to live in cities, urban growth results. The rapid growth of cities like Chicago in the late 19th century and Shanghai a century later can be attributed largely to people from rural communities migrating there. This kind of growth is especially commonplace in developing countries.

The rapid urbanization of the world's population over the twentieth century is described in the 2005 Revision of the UN World Urbanization Prospects report.

The global proportion of urban population rose dramatically from 13% (220 million) in 1900, to 29% (732 million) in 1950, to 49% (3.2 billion) in 2005. The same report projected that the figure is likely to rise to 60% (4.9 billion) by 2030..

However, French economist Philippe Bocquier, writing in THE FUTURIST magazine, has calculated that "the proportion of the world population living in cities and towns in the year 2030 would be roughly 50%, substantially less than the 60% forecast by the United Nations (UN), because the messiness of rapid urbanization is unsustainable. Both Bocquier and the UN see more people flocking to cities, but Bocquier sees many of them likely to leave upon discovering that there's no work for them and no place to live."

According to the UN State of the World Population 2007 report, sometime in the middle of 2007, the majority of people worldwide will be living in towns or cities, for the first time in history; this is referred to as the arrival of the "Urban Millennium". In regard to future trends, it is estimated 93% of urban growth will occur in developing nations, with 80% of urban growth occurring in Asia and Africa.

Urbanization rates vary between countries. The United States and United Kingdom have a far higher urbanization level than China, India, Swaziland or Niger, but a far slower annual urbanization rate, since much less of the population is living in a rural area.

- Urbanization in the United States never reached the Rocky Mountains in locations such as Jackson Hole, Wyoming;

Telluride, Colorado; Taos, New Mexico; Douglas County, Colorado and Aspen, Colorado. The state of Vermont has also been affected, as has the coast of Florida, the Birmingham-Jefferson County, AL area, the Pacific Northwest and the barrier islands of North Carolina.

- In the United Kingdom, two major examples of new urbanization can be seen in Swindon, Wiltshire and Milton Keynes, Buckinghamshire. These two towns show some of the quickest growth rates in Europe.

Cause

Urbanization occurs naturally from individual and corporate efforts to reduce time and expense in commuting and transportation while improving opportunities for jobs, education, housing, and transportation. Living in cities permits individuals and families to take advantage of the opportunities of proximity, diversity, and marketplace competition.

People move into cities to seek economic opportunities. In rural areas, often on small family farms, it is difficult to improve one's standard of living beyond basic sustenance. Farm living is dependent on unpredictable environmental conditions, and in times of drought, flood or pestilence, survival becomes extremely problematic. Cities, in contrast, are known to be places where money, services and wealth are centralised. Cities are where fortunes are made and where social mobility is possible.

Businesses, which generate jobs and capital, are usually located in urban areas. Whether the source is trade or tourism, it is also through the cities that foreign money flows into a country. It is easy to see why someone living on a farm might wish to take their chance moving to the city and trying to make enough money to send back home to their struggling family.

There are better basic services as well as other specialist services that aren't found in rural areas. There are more job opportunities and a greater variety of jobs.

Health is another major factor. People, especially the elderly are often forced to move to cities where there are doctors and hospitals that can cater for their health needs. Other factors include a greater variety of entertainment (restaurants, movie theatres,

theme parks, etc) and a better quality of education, namely universities. Due to their high populations, urban areas can also have much more diverse social communities allowing others to find people like them when they might not be able to in rural areas.

These conditions are heightened during times of change from a pre-industrial society to an industrial one. It is at this time that many new commercial enterprises are made possible, thus creating new jobs in cities. It is also a result of industrialisation that farms become more mechanised, putting many labourers out of work. This is currently occurring fastest in India.

One of the last houses of the old Russian village of Lukeryino, most of which has been demolished over the last 30 years to make way for 9-story apartment buildings in the growing city of Kstovo, such as the one in the background

In recent years, urbanization of rural areas has increased. As agriculture, more traditional local services, and small-scale industry give way to modern industry the urban and related commerce with the city drawing on the resources of an ever-widening area for its own sustenance and goods to be traded or processed into manufactures.

Research in urban ecology finds that larger cities provide more specialized goods and services to the local market and surrounding areas, function as a transportation and wholesale hub for smaller places, and accumulate more capital, financial service provision, and an educated labour force, as well as often concentrating administrative functions for the area in which they lie. This relation among places of different sizes is called the urban hierarchy.

As cities develop, effects can include a dramatic increase in costs, often pricing the local working class out of the market, including such functionaries as employees of the local municipalities. For example, Eric Hobsbawm's book *The age of the revolution: 1789–1848* (published 1962 and 2005), stated "Urban development in our period [1789–1848] was a gigantic process of class segregation, which pushed the new labouring poor into great morasses of misery outside the centres of government and business and the newly specialised residential areas of the bourgeoisie. The almost universal European division into a 'good' west end and a 'poor' east end of large cities developed in this period." This is

likely due the prevailing south-west wind which carries coal smoke and other airborne pollutants downwind, making the western edges of towns preferable to the eastern ones.

Urbanization is often viewed as a negative trend, but in fact, it occurs naturally from individual and corporate efforts to reduce expense in commuting and transportation while improving opportunities for jobs, education, housing, and transportation. Living in cities permits individuals and families to take advantage of the opportunities of proximity, diversity, and marketplace competition.

Environmental Effects

The urban heat island has become a growing concern. Urban sprawl creates a number of negative environmental and public health outcomes. For more than 100 years, it has been known that two adjacent cities are generally warmer than the surrounding areas. This region of city warmth, known as an urban heat island, can influence the concentration of air pollution. The urban heat island is formed when industrial and urban areas are developed and heat becomes more abundant. In rural areas, a large part of the incoming solar energy is used to evaporate water from vegetation and soil. In cities, where less vegetation and exposed soil exists, the majority of the sun's energy is absorbed by urban structures and asphalt. Hence, during warm daylight hours, less evaporative cooling in cities allows surface temperatures to rise higher than in rural areas. Additional city heat is given off by vehicles and factories, as well as by industrial and domestic heating and cooling units. This effect causes the city to become 2 to 10° F (1 to 6° C) warmer than surrounding landscapes. Impacts also include reducing soil moisture and intensification of carbon dioxide emissions.

Changing form of Urbanization

Massive urbanization in Delhi, India resulted in tremendous strain on the city's infrastructure. The planned Dwarka Sub City can be seen in foreground while the unplanned and congested residential areas of West Delhi are visible in the background.

Different forms of urbanization can be classified depending on the style of architecture and planning methods as well as historic

growth of areas. In cities of the developed world urbanization traditionally exhibited a concentration of human activities and settlements around the downtown area, the so-called *in-migration*. In-migration refers to migration from former colonies and similar places. The fact that many immigrants settle in impoverished city centres led to the notion of the "peripheralization of the core", which simply describes that people who used to be at the periphery of the former empires now live right in the centre.

Recent developments, such as inner-city redevelopment schemes, mean that new arrivals in cities no longer necessarily settle in the centre. In some developed regions, the reverse effect, originally called counter urbanisation has occurred, with cities losing population to rural areas, and is particularly common for richer families. This has been possible because of improved communications, and has been caused by factors such as the fear of crime and poor urban environments. Later termed "*white flight*", the effect is not restricted to cities with a high ethnic minority population.

When the residential area shifts outward, this is called suburbanization. A number of researchers and writers suggest that suburbanization has gone so far to form new points of concentration outside the downtown. This networked, poly-centric form of concentration is considered by some an emerging pattern of urbanization. It is called variously exurbia, edge city (Garreau, 1991), network city (Batten, 1995), or postmodern city (Dear, 2000). Los Angeles is the best-known example of this type of urbanization.

Rural migrants are attracted by the possibilities that cities can offer, but often settle in shanty towns and experience extreme poverty. In the 1980s, this was attempted to be tackled with the urban bias theory which was promoted by Michael Lipton who wrote: "...the most important class conflict in the poor countries of the world today is not between labour and capital. Nor is it between foreign and national interests. It is between rural classes and urban classes.

The rural sector contains most of the poverty and most of the low-cost sources of potential advance; but the urban sector contains most of the articulateness, organization and power. So the urban classes have been able to win most of the rounds of the struggle

with the countryside...". Most of the urban poor in developing countries able to find work can spend their lives in insecure, poorly paid jobs. According to research by the Overseas Development Institute pro-poor urbanisation will require labour intensive growth, supported by labour protection, flexible land use regulation and investments in basic services.'

Planning for Urbanization

Urbanization can be planned urbanization or organic. Planned urbanization, ie: new town or the garden city movement, is based on an advance plan, which can be prepared for military, aesthetic, economic or urban design reasons. Examples can be seen in many ancient cities; although with exploration came the collision of nations, which meant that many invaded cities took on the desired planned characteristics of their occupiers. Many ancient organic cities experienced redevelopment for military and economic purposes, new roads carved through the cities, and new parcels of land were cordoned off serving various planned purposes giving cities distinctive geometric designs. UN agencies prefer to see urban infrastructure installed before urbanization occurs. landscape planners are responsible for landscape infrastructure (public parks, sustainable urban drainage systems, greenways etc) which can be planned before urbanization takes place, or afterward to revitalized an area and create greater livability within a region. Concepts of control of the urban expansion are considered in the American Institute of Planners.

New Urbanism

New Urbanism was a movement which started in the 1990s. New Urbanism believes in shifting design focus from the car-centric development of suburbia and the business park, to concentrated pedestrian and transit-centric, walk able, mixed-use communities. New Urbanism is an amalgamation of old-world design patterns, merged with present day demands. It is a backlash to the age of suburban sprawl, which splintered communities, and isolated people from each other, as well as had severe environmental impacts. Concepts for New Urbanism include people and destinations into dense, vibrant communities, and decreasing dependency on vehicular transportation as the primary mode.

MIGRATION, REMITTANCES AND DEVELOPMENT

Although few scholars would deny the direct contribution of migration and remittances to the livelihoods and survival of families left behind, the extent to which migration and remittances can bring about sustained human development and economic growth in migrant-sending areas and countries is quite a different question. This issue has been the subject of heated debate over the past four decades, and it is possible to distinguish four periods in the post–Second World War thinking on migration and development. While "developmentalist" optimism dominated in the 1950s and 1960s, large-scale pessimism prevailed in the 1970s and 1980s. This changed with the emergence of more nuanced views in the 1990s and the current rediscovery of remittances, and the concomitant resurgence of optimism on migration and development in recent years.

Developmentalist and Neoclassical Views

In the developmentalist era of the 1950s and 1960s, it was widely assumed that, through a policy of large-scale capital transfer and industrialization, poor countries would be able to jump on the bandwagon of rapid economic development and modernization. In the same period, large-scale labour migration from developing to developed countries began to gain momentum. Many developing countries (such as the source countries of "guest workers" in the Mediterranean) became involved in the migration process amidst these expectations of the "dawning of a new era" (Papademetriou 1985:212). Governments of developing countries started to actively encourage emigration since they considered it as one of the principal instruments to promote national development.

Developmentalist "migration optimists" tend to think that migration leads to a North-South transfer of investment capital and accelerates the exposure of traditional communities to liberal, rational and democratic ideas, modern knowledge and education. From this perspective, (return) migrants are perceived as important agents of change, innovators and investors. The general expectation was that the flow of remittances—as well as the experience, skills and knowledge that migrants would acquire abroad before

returning—would greatly help developing countries in their economic take-off. Return migrants were expected to invest large sums of money in enterprises in the country of origin. Interestingly, this optimistic view has recently experienced a renaissance, although it is now linked to (neo)liberal, rather than the state-centrist, visions of development policy that predominated in the 1950s and 1960s. Neoclassical economists also tend to see migration in a positive light.

However, it is important to note that neoclassical migration theory has no place for remittances (Taylor 1999:65). Neoclassical advocates of the theoretical model of balanced growth perceive migration as a process that contributes to the optimal allocation of production factors for the benefit of all, in which the process of factor price equalization will lead to migration ceasing once wage levels are equal at both the origin and destination. From this perspective, the re-allocation of labour from rural, agricultural areas (within and across national boundaries) to urban, industrial sectors is considered as an essential prerequisite for economic growth and, hence, as an integral component of the whole development process (Todaro 1969:139). The free movement of labour—in an unconstrained market environment—is eventually expected to lead to the increasing scarcity of labour, which will then lead to a higher marginal productivity of labour and increasing wage levels in migrant-sending societies. Capital flows are expected to go in exactly the opposite direction as labour migration.

So, in a strictly neoclassical world, the developmental role of migration is entirely realized through this process of factor price equalization. Until recently, this neoclassical view of migration and development was dominant in international financial institutions. For instance, the "Policies toward migration" section of the *Globalization, Growth, and Poverty* report of the World Bank (2002) saw the benefits of migration for receiving countries uniquely in terms of factor price equalization, and did not mention remittances at all. This is in contrast with Ratha's (2003) chapter entitled "Workers' remittances: An important and stable source of external development finance" in the World Bank's *Global Development Finance* only one year later, and which played a major role in the sudden resurgence in the interest for remittances.

Historical Structural and Dependency Views

The 1973 oil crisis heralded a period of worldwide economic downturn, industrial restructuring and increasing unemployment. It was also thought that the great age of international migration had ended. This more or less coincided with a turning point in thinking on migration and development. As of the late 1960s, optimistic views on migration and development in sending areas were increasingly challenged due to the combined influence of a paradigm shift in social sciences toward (historical) structuralist views and an increasing number of empirical studies that often did not support optimistic views on migration and development.

An increasing number of academic studies seemed to support the hypothesis that migration sustains or even reinforces problems of underdevelopment instead of the reverse. These "migration pessimists" have argued that migration provokes the withdrawal of human capital and the breakdown of traditional, stable village communities and their economies. This would then lead to the development of passive, non-productive and remittance-dependent communities. Besides the "brain drain" (Adams 1969), a "brawn drain" (Penninx 1982)—the massive departure of young, able-bodied men and women from rural areas (Lewis 1986)—is typically blamed for causing a critical shortage of agricultural and other labour, depriving areas of their most valuable work force. Because it is generally not the poorest who migrate the most, migration and remittances were also believed to increase inequality in communities of origin (Lipton 1980).

Migration pessimists have also argued that remittances were mainly spent on conspicuous consumption and "consumptive" investments (such as houses), and rarely invested in productive enterprises. Scepticism about the use of migrant remittances for productive investments became the common thread of the migration and development debate. Besides weakening local economies and increasing dependency, increased consumption and land purchases by migrants were also reported to provoke inflationary pressures (Russell 1992) and soaring land prices.

Also, in a sociocultural respect, the effects of migration and remittances were increasingly seen as detrimental. Exposure to the wealth of migrants was assumed to contribute to a change in rural

tastes (Lipton 1980) that would increase the demands for imported urban or foreignproduced goods and food. This would further reinforce the cycle of increasing dependency. Migration has often been held responsible for the loss of community solidarity and undermining the sociocultural integrity of migrant-sending communities (Hayes 1991). Moreover, the main "positive" effect of migration, the increase in family welfare for migrants and their families, was considered to be artificial and dangerous, because remittances were supposed to be an unstable and temporary source of revenue.

From this perspective, South-North migration was perceived as discouraging instead of encouraging the autonomous economic growth of migrant-sending countries. Such views conform to the historical-structuralist paradigm on development that perceives migration as one among many other expressions of the developing world's increasing dependency on the global political-economic systems dominated by the powerful (Western) states. As a natural outgrowth of capitalist penetration, migration was seen as having ruined traditional peasant societies by undermining their economies and uprooting their populations.

In particular, the dependency school of development thinking viewed capitalist penetration and its concomitant phenomena such as migration not only as detrimental to the economies of underdeveloped countries, but also as the very *causes* of the "development of underdevelopment" (Frank 1966). In a process known as cumulative causation (Myrdal 1957), increasing prosperity in the economic core areas of the Western world was causally linked to the draining of capital and labour from peripheral areas. In fact, these approaches turned the argument of neoclassical and developmentalist approaches upside down: migration does not decrease, but instead reinforces spatial and interpersonal disparities in development.

In neo-Marxist terms, migration and remittances reproduce and reinforce the capitalist system based on inequality. Although these pessimistic views have been increasingly contested in recent years, they have remained prevalent in some recent studies. Dependency and structuralist perspectives are not alone in making the point that migration can exacerbate international inequalities and can

lead to a concentration of qualified human resources in a few recipient countries. New research, partly based on endogenous growth theories with increasing returns, also predicts this result (Solimano forthcoming).

New Economics of Labour Migration and Livelihood Approaches

In the 1980s and 1990s, the new economics of labour migration (NELM) emerged mainly within the American research context as a response to developmentalist and neoclassical theories (the migration optimists) and structuralist theory (the migration pessimists). Such approaches seemed too rigid and determinist to deal with the complex realities of the migration and development interactions. NELM offered a much more subtle view of migration and development, which links causes and consequences of migration more explicitly, and in which both positive and negative development responses are possible.

Stark (1978, 1991), in particular, revitalized academic thinking on migration from the developing world by placing the behaviour of individual migrants within a wider societal context and considering the *household*—rather than the individual—as the most appropriate decision-making unit (Taylor 1999). This new approach models migration as the risk-sharing behaviour of households. Better than individuals, households seem able to diversify resources such as labour in order to minimize income risks. This approach integrates motives other than individual income maximization that play a role in migration decision making. Migration is perceived as a household response to income risks since migrant remittances serve as income insurance for households of origin. This can theoretically explain why people migrate even in the absence of substantial income differentials. In addition to its contribution to more stable and secure household livelihoods, NELM scholars argue that migration plays a vital role in providing a potential source of investment capital, which is especially important in the context of the imperfect credit (capital) and risk (insurance) markets that prevail in most developing countries. Such markets are often weakly developed and inaccessible to non-elite groups. Hence, migration can be considered as a livelihood strategy to overcome

various market constraints, potentially enabling households to invest in productive activities and improve their livelihoods. This went along with fundamental criticism on the weak methodological foundations, poor analytical quality or empiricist character of much prior research, which often failed to take into account the complex, often indirect, positive impacts of migration and remittances on migrant-sending communities as a whole, including non-migrant households.

NELM has striking—though as yet unobserved—conceptual parallels with the *livelihood approaches* that evolved as of the late 1970s among geographers, anthropologists and sociologists conducting microresearch in developing countries. On the basis of their research, they argued that poor people cannot be seen only as passive victims of global capitalist forces (as neo-Marxist and dependency approaches tended to do), but also as trying to actively improve their livelihoods within the constraining conditions in which they live. This view points to the fundamental role of *human agency*. From this perspective, migration is seen as one of the main elements of strategies to diversify, secure and improve livelihoods. This conception comes rather close to the premises of NELM, and both approaches can be integrated if migration is seen as part of a broader *household livelihood strategy* to diversify income sources and overcome social, economic and institutional development constraints in places of origin.

These shifts in thinking on migration and development seem deeply influenced by the paradigm shift in social theory in which social scientists, sometimes inspired by Giddens' (1984) structuration theory, sought to harmonize actor-and structure-oriented approaches. Recognition of the interaction between structure and agency seems essential for the migration and development debate, as this also enables a clearer understanding of the heterogeneity of migration impacts. In "pluralist" views on migration and development such as NELM and the livelihoods approach, the results of the structure-actor interactions allow for a greater variety of outcome than would have been allowed from either the aggregation of individual decision making or from the unidirectional imperatives of structure. The fundamental question is, therefore, not whether migration has either positive or negative developmental impacts, but why migration has contributed to

development in some communities and much less, or even negatively, in others and what factors explain this differentiation. Furthermore, impacts often change with the different stages of the migration process. Hence, we need to better understand the geographically differentiated and socially disparate nature of migration and remittance impacts as well as how these impacts change over time.

The sparse amount of pertinent micro-level data has long constrained the field of research on migration, remittances and development. Fortunately, there has been a considerable increase in the number of empirical studies over the past decade. The remainder of this paper not only reviews the empirical literature on the impacts of remittances and migration on social development, but also addresses the theoretical implications of these empirical findings.

MIGRATION AND INEQUALITY IN A SPATIO-TEMPORAL PERSPECTIVE

One of the "truths" put forward by structuralist and dependency perspectives has been that migration and remittances have a negative effect on income inequality within migrant-sending communities as well as between peripheral and central regions. In turn, this increased inequality would further stimulate out-migration, setting in motion a cycle of "cumulative causation" of migration—deepening inequalities—and more migration. However, recent research has provided enough evidence to reject this as a general hypothesis. Although inequality-increasing effects have been found in various studies at the regional (Adams 1989) and national (Mishra 2007) levels, this mechanism is not inevitable. It is more correct to say that the impacts of migration on income inequality in migrant-sending communities vary for different types of migration and for different periods in a community's migration history. First, non-migrants can benefit indirectly from consumption and investments by remittance-receiving migrant households through employment creation and income multipliers. Second, there are other arguments to contradict blanket claims that migration leads to more inequality, which are related to the spatio-temporal dimensions of migration.

As with impacts on poverty, the effect of remittances on income distribution and other aspects of wealth is primarily a function of migration selectivity. If migrants mainly originate from relatively wealthy households, migration is more likely to imply greater inequality in the community of origin, while the reverse seems likely if migrants come from relatively poor households. Pioneer migrants tend to be from relatively wealthy households, as early migration—analogous to the adoption and diffusion of a new technology through space and populations—often entails high costs and risks. Although (pioneer) migrants tend to be relatively wealthy and educated, this is not always the case. The initial pattern of migration selectivity differs according to destination (for example, international versus internal migration), type of work (for example, low skilled or high skilled, legal or undocumented) and mode of job acquisition (for example, formal recruitment or family-based forms of "self-help"). Second, migration selectivity tends to change over time. During the first stages of the evolution of a migration system—defined as spatially clustered flows and counterflows of people, goods and remittances between a particular community of origin and a particular destination— selectivity tends to decrease rapidly. Through the development of social networks between migrants and people staying behind, which diminish the risks and costs of migration (Bauer and Zimmermann 1998:5), and the flow back of information (Korner 1987), less wealthy households tend to gain increasingly easy access to international migration. As a consequence of this diffusion process, the initially negative effect of remittances on income equality might, therefore, be dampened or even reversed in the long term. However, Jones (1998b) demonstrated that inequality may again increase at the "late adopters" stage of migration, when selectivity of migration, other things being equal, tends to increase again.

Thus, the impacts of migration on village income distribution clearly vary for different types of migration and for different periods in a community's migration history. Kanbur and Rapoport (2005) demonstrated that increased migration from poorer to richer areas may in fact coexist with increasing or decreasing spatial inequalities, and that the question of whether divergence or convergence occurs critically depends on specific patterns of migration selectivity and agglomeration effects arising from migrant networks.

Third, differences in spatial scales of analysis may account for contradictory conclusions concerning the effect of migration on income distribution. For instance, one might conclude that migration has contributed to increasing interhousehold income inequality within a certain community or region. However, when comparing this migrant-sending region as a whole with other more wealthy and centrally located regions in the same country (or between countries), one may find that inequality between the regions has actually *decreased* as a consequence of the developmental effects of migration and remittances. The choice for either of the two scales is not obvious, and might partly reflect value judgements.

Spatial and temporal scales of analysis also matter when identifying whether so-called extraregional *leakage* of migrant remittances to central regions and cities occurs, which, according to dependency and centre-periphery theory, would lead to a deepening of spatial development inequalities. For the result of such analysis, it matters whether or not the village or the wider region in which it is located is identified as "origin". In the first case, all investments made outside the village are thought to deepen spatial inequalities. In the second case, the analysis will tend to be far more on the positive side. In Morocco, for instance, many migrants do not necessarily invest their money in houses or businesses in the village of origin, but often do so in small-to medium-sized regional towns, which has given rise to a process of microurbanization *within* migrant-sending regions (Berriane 1997).

Such evidence indicates that migration and remittances do not automatically lead to increased inequalities between the developed "core" and the underdeveloped "periphery", as predicted by dependency and structuralist views. However, the neoclassical assumption that migration leads to factor price equalization certainly should not also be taken as axiomatic.

Value Judgements, Ancient and New Forms of Inequality

Structuralist views on migration and development see migration as a process that has destabilized and uprooted traditional peasant communities. However, the idea that migration has uprooted peasants from their stable communities for the first

time reflects a romanticized, and fundamentally flawed, sedentary view of traditional peasant life (Skeldon 1997:32). Assumptions of the negative impact of migration and remittances on inequality and community cohesion or solidarity are often based on the implicit, romantic idea that "traditional" communities were more egalitarian. This often ignores ancient inequalities between ethnic and class groups. Migration and remittances can have profound consequences for class and ethnic hierarchies. Traditional social hierarchies may be fundamentally upset if lower-or middle-status groups manage to migrate internationally and obtain access to international remittances. However, whether to judge such changes as "positive" or "negative" strongly depends on whether we adopt the viewpoints of the relative winners or losers of such community transformations. While older elites might view migration as a devastating process, lower-or middle-class groups may have a more mixed or positive opinion. In San Pedro Pinula (Guatemala), for instance, the migration and return of Mayan residents has permitted them to slowly challenge ethnic roles that have developed over the last five centuries.

In southern Moroccan oases, migration and remittances have been an important avenue for upward socioeconomic mobility for the *haratin*, a low-status social group mainly consisting of black sharecroppers. In this case, *new* forms of inequality, which are to a considerable extent based on access to international remittances, have been partly superimposed upon the traditional, castelike forms of hereditary inequality based on kinship, skin colour and land ownership (de Haas 2006). There are no objective, scientific standards for determining which form of inequality was worse. However, it is important not to ignore the fact that traditional oasis society used to deny basic human freedoms to large sections of the population (including women, slaves, serfs and sharecroppers). In such cases, instead of increased inequalities per se, it is perhaps better to speak of new inequalities based on access to external monetary resources through livelihood diversification, a process in which migration tends to play a preponderant role.

Hence, it is important to carefully consider the specific historical evolution of class or ethnic stratifications as well as the relative access of classes and ethnic groups to migration in order to assess

the impact of migration and remittances upon inequalities. A recent overview of case studies on migration and inequality across Central America, Eastern Europe, West Africa and South Asia demonstrates how the mutual causality between migration and inequality varies both between and within regions, and emphasizes the need for defining which kind of migration and which kind of inequality are being analysed. To a considerable extent, "measuring" the impact of migration and remittances on inequality is an ambiguous and normative affair. For instance, conclusions on the "severity" of inequality partly depend on the weight attached to incomes of households at different points in the income distribution when calculating indices of inequality. There is also no objective, scientific yardstick with which to judge a situation in which inequality has increased, but in which the majority of migrant and non-migrant households are better off and poverty has decreased. This scenario exemplifies the ambiguities involved in attaching relative weights to distributional versus absolute income objectives.

9

Water Distribution Disputes

RECENT WATER CONFLICTS

Not surprisingly, this situation has already led to numerous small-scale local conflicts, began in the late 1980s when the central authorities weakened their grip on Central Asia. In 1990, the outbreak of conflict in the Kyrgyz town of Osh, on the border with Uzbekistan, claimed over 300 lives and was provoked by fierce competition for water together with high population density, limited arable land and ethnic dimension (large population of Uzbeks living in the area).

Since summer 1993, there have been serious water tensions between Kyrgyzstan and Uzbekistan. Kyrgyzstan was blamed by the Uzbek authorities for releasing too much water from the Toktogul reservoir. Extra water did not reach the Aral Sea but was dumped instead into the Aydarkul depression, the large 'sinus' which has developed as a result of years of negligence (Kltzli, 1994). In 1997, Uzbekistan has deployed 130,000 troops on the Kyrgyz border to guard the reservoirs straddling the two countries (Hogan, 2000b; Grozin, 2001). In June 2001, the Kyrgyz parliament adopted a law classifying water as a commodity, and the government followed up by announcing that the downstream countries would be charged for the water they use. Uzbekistan's

response was to cut off all deliveries of gas to Kyrgyzstan and accuse Kyrgyzstan of failing to honour the barter agreement to provide Uzbekistan with water in return for oil and gas. Although weaker in political and military terms Kyrgyzstan acknowledged this failure, Uzbekistan would be emboldened to behave in a more aggressive manner towards its neighbours. The two were on the verge of violent conflict for several times (Khamidov, 2001).

Current Water Disputes

Central Asia's two major rivers, as well as their tributaries, have become a focus for growing competition among their riparians, with the Syr Darya being a particular point of tensions. The Amu Darya is rapidly becoming a locus of disputes as the governments of Turkmenistan and Uzbekistan become more hostile towards each other competing also for water, and Afghanistan is about to demand its share. These tensions have so far been contained without conflict, but all parties have shown a willingness to put their interests first at any cost, including military intervention. Due to their reliance on agriculture, Uzbekistan and Turkmenistan view irrigation as a key security issue (ICG, 2002b).

The Syr Darya Basin

The Syr Darya is shared by four states and, in case of Uzbekistan, is shared twice as after flowing from Kyrgyzstan and crossing the Uzbek part of the Ferghana valley the river flows into the Tajik territory in the western Ferghana Valley and then pours again into Uzbekistan. After crossing the Hunger Steppe, the Syr Darya runs into Kazakhstan.

Kyrgyzstan and Uzbekistan have had particularly discordant history over the use of water from the Syr Darya. Since independence, Kyrgyzstan faces serious economic problems, mainly because of a shortage of energy supply from Russia, Kazakhstan and Uzbekistan. The primacy of energy production over the irrigation needs downstream has already created a major discord between Uzbekistan and Kyrgyzstan (Klötzli, 1994). The 1998 Syr-Darya Framework Agreement between the two has been broken by both sides. The implementation of such barter agreement runs across one major problem – all barter agreements are delayed

until the late spring when the downstream countries urgently need water for irrigation. As this might be the case, Kyrgyzstan would have had an incentive to produce less electricity. However, due to Kyrgyzstan's uncertainty whether enough gas would be provided, it produces electricity to protect itself giving rise to a vicious circle (IGC, 2002).

Uzbekistan intensified the tension more than once by acting in a unilateral manner. In July 1997, it cut off 70 percent of downstream flow, which caused a riot among the Kazakh farmers whose 100,000 hectares were threatened (O'Hara, 1998; Hogan, 2000b). History of altering water flow by upstream riparians is no more soothing. In summer 1999, Tajikistan released 700 million cubic meters of water from its Kairakum reservoir without warning its downstream neighbours. As a result, cotton crops in southern Kazakhstan which has received less water than was agreed, were devastated. The situation was seriously aggravated by Kyrgyzstan's concurrent move to reduce the flow to southern Kazakhstan in retaliation for Kazakhstan's failure to supply coal under the barter agreements. After months of talks, the incident was finally settled (Hogan, 2000a).

At issue is also the Naryn-Syr Darya cascade of dams in Kyrgyzstan. Every year Uzbekistan insists on releasing water from it to improve downstream agriculture. Several times, the conflict was on the verge of war. In 1997, Uzbekistan deployed 130,000 troops on the Kyrgyz-Uzbek border, near the Toktogul reservoir, to conduct military exercises aimed at seizure of a 'well guarded object', using the armour and helicopters. Meanwhile, Kyrgyzstan, through media leak, hinted that in case the reservoir would be blown up, the resulting flood would sweep away Uzbekistan's Ferghana and Zeravshan Valleys (Grozin, 2001).

Kyrgyzstan has tried to persuade Uzbekistan and Kazakhstan to share the maintenance and operating costs of the Toktogul reservoir but these attempts were turned down by the downstream countries. Kazakhstan claimed that it would not be able to pay the costs – between US$ 15 and 27 million per annum. Thus, the opportunity for the downstream riparians to settle the dispute was missed. However, by adopting *Law on the Interstate Use of Water Objects, Water Resources and Water Management Installations*

on 29 June 2001, the Kyrgyz parliament left the door open to push the downstream countries into negotiations regarding the maintenance costs of the Toktogul reservoir as later Kyrgyzstan stated that in fact it demanded to pay only for the water passing through Kyrgyz reservoirs, i.e. share maintenance costs. This was welcomed by Kazakhstan who agreed to pay for the maintenance of the Kyrgyz water installations, but initially opposed by Uzbeks. However, in March 2002 Uzbekistan reached the agreement with Kyrgyzstan that it would share some costs in return for the guarantee that it would receive water for irrigation. Had more attention have been paid to the barter agreements working properly, the main step to resolving the Syr Darya dispute between Kyrgyzstan and Uzbekistan would be taken (ICG, 2002b).

Shared water storage facilities, like the Andijan reservoir located in the Uzbek part of the Ferghana Valley but supposed to re-channel some water back to Kyrgyzstan, also represent an inter-state problem (Chait, 1998).

The Amu Darya Basin

The Amu Darya is shared by four countries – Tajikistan as the upstream riparian, Afghanistan, Uzbekistan and Turkmenistan – and forms the border in some stretches between Tajikistan, Uzbekistan and Afghanistan, and between Turkmenistan and Uzbekistan.

The Amu Darya is much less regulated and has fewer dams and reservoirs to cause potential problems. However, there are serious tensions along the flow of the river not only between the upstream and downstream riparians, as, for example, between Tajikistan and Uzbekistan, but also between the middle and lower riparians, for example, Uzbekistan and Turkmenistan.

According to the 1992 water quota agreement, Tajikistan is entitled to 9 m^3 of about 75 m^3 of annual flow of the Amu Darya, or 12 percent. This is considered low by Tajikistan who needs to expand its agricultural output to supply the growing population with food. Tajikistan's agriculture is underdeveloped since the Soviet times, and the irrigation system is derelict and in need of urgent repairs. Tajikistan sees the only way out as using more water either by increasing its water quota from the Amu Darya

or by diverting the Zeravhsan river. As 95 percent of the latter are used by Uzbekistan, this would cause serious tensions with Tajikistan's much powerful neighbour.

In contrast, increasing the Amu Darya quota seems to be quite easy, since Tajikistan has an upper hand in distributing water resources of the Amu Darya. In principle, nobody could prevent Tajikistan from taking more water than was allocated by the water quota agreement. It is very hard to monitor Tajikistan's performance, as most equipment needed has been destroyed during the civil war in 1992-1997. But even Tajikistan were to increase its water quota moderately, this would have an immediate impact downstream.

The same water/energy complex as with Kyrgyzstan has developed between Tajikistan and Uzbekistan. Tajikistan's central and southern parts are well provided by electricity from the Nurek hydro plant, and northern Tajikistan having no grid lines with the rest of the country relies on Uzbekistan's intermittent supplies of electricity and gas in winter. In return, Tajikistan provides power to southern Uzbek provinces and often requests that Uzbekistan switched off electricity to northern Tajikistan to keep imports within the agreed limit not to pay higher price. This causes serious discontent as Tajikistan is forced to have electricity rationed in many provinces due to poor state of Tajikistan's grid lines. The country desires to develop its hydropower resources to break dependence on Uzbekistan. But increasing hydro consumption would seriously affect the downstream access to seasonal water supplies and to create further discord along the Amu Darya course.

The most dramatic conflict over the Amu Darya water resources is between downstream nations of Uzbekistan and Turkmenistan. Both equally depend on their cotton production and irrigation agriculture and both claim that each of them exceed their water quotas. Due to the very poor state of Turkmenistan's water infrastructure, most water received by Turkmenistan is wasted. The country does not want to spend huge funds for the expensive rehabilitation of crippling Turkmen canals and draws off more water from the Amu Darya instead. The relations between two countries dramatically worsened in the late 2002 when the Uzbek ambassador has been declared persona non grata in Turkmenistan

on accusation of participating in the conspiracy to oust and kill President Niyazov. Uzbek-Turkmen relations over water can grow even worse, given Turkmenistan's ambitious plan to complete a huge reservoir in the Karakum desert, called the Golden Century Lake. Another point of contention is the Tyuyamuyun reservoir in the delta of the Amu Darya divided between Uzbekistan and Turkmenistan. Both sides feel displeased with the wasteful use of water, and this led to an outbreak of violence in 1992 over the re-direction of drainage waters and raids by both sides to cut off pipes and irrigation canals (Smith, 1995). Today, the Tyuyamuyun remains one of the several disputed areas in continuing water dispute with Uzbekistan.

Throughout the independence period, rumours have circulated of a small-scale secret war between the two states over the river resources, Uzbekistan troops taking control of water installations on the Turkmen bank of the Amu Darya, and even of a massacre of a large number of Uzbekistan troops in Turkmenistan in 2001. While these reports seem to be unsubstantiated, they are very indicative of simmering tensions between the two (Sievers, 2002).

MULTIDIMENSIONAL NATURE OF CENTRAL ASIA'S WATER DISPUTES

Water disputes contribute to the broader complex of problems across the region, including border disputes, Islamic extremism, high population growth, ethnic tensions, clan competition, human rights and political instability. The desiccation of the Aral Sea has been the important factor to the worsening socio-economic conditions in the area, fuelling nationalist ideas among the population of Karakalpakstan, the Uzbek autonomous republic adjacent to the disaster zone, and aggravating water situation in the region. Lack of public participation, particularly in authoritarian Turkmenistan and Uzbekistan, and attempts of those governments to find military decisions in already difficult relationships between those countries and upstream states makes the whole situation white-hot.

Ethnic dimension is extremely important for ethnically diverse Kyrgyzstan and Uzbekistan. As it happens, local conflicts here have been more serious than wider ones. Disputes over land and

water resources provoking wider ethnic conflict have led to hundreds of victims in Kyrgyzstan in 1990. Poverty, rising costs and crumbling water infrastructure are adding to strains in local water system. Water affects the poor who end up paying the large proportion of their income for the resource.

Especially vulnerable to violent eruptions over water and ethnicity is the Ferghana Valley shared by Tajikistan, Kyrgyzstan and Uzbekistan which has already seen the outbreaks of violence, like it was in 1990, when bloody clashes between inhabitants of the Kyrgyz town of Osh claimed over 300 lives, or earlier, in 1989, when hundreds of the Meskhetian Turks, who had been deported to Central Asia by Stalin in the 1940s, were killed in the Uzbek town of Ferghana in what was called one of the most dramatic episodes of inter-ethnic relations in the Soviet Union.

The roots of any future ethnic strife in Central Asia lie in the unresolved social and economic problems, competition for scarce water and grazing resources and contentions over discriminatory land allocations (Elhance, 1997). Potentially explosive ethnic cleavages tear apart many countries in the region. Kyrgyzstan is divided between northern and southern part, with the latter gravitating towards Uzbekistan and inhabited by large proportion of ethnic Uzbeks who have repeatedly demanded to give the area more autonomy. Uzbekistan's headache is the large Tajik population living in Samarkand and Bukhara. Over the last years, Uzbekistan's policy was to suppress Tajik ethnic identity by not allowing schools to learn in Tajik language and forcing many Tajiks to call themselves ethnic Uzbeks in their Uzbek passports. The same situation is in Tajikistan where a lot of ethnic Uzbeks live. In the late 1990s, after the relations between Uzbekistan and Tajikistan have worsened, the Tajik government expelled many Uzbeks to neighbouring Kyrgyzstan and Afghanistan in an attempt to get rid of "extremist elements. Ethnic minorities have often been viewed by authoritarian governments as potential provocateurs, separatists and extremists (ICG, 2002a). Historic competition between peoples of Central Asia is fuelled by the fact that their leaders do not seem to like one another. There is a great personal competition between the three former Communist leaders, Uzbekistan's Islam Karimov, Kazakhstan's Nursultan Nazarbaev

and Turkmenistan's Saparmurad Niyazov. Each wants to show that his country is the region's most powerful and he therefore should be viewed as the most prominent political figure in Central Asia. As a consequence, the leaders of the region does not see their countries to be the part of a functioning regional subsystem and are rather isolationist in their policies. For all this, they regularly meet to discuss their common problems (Olcott, 2001).

Territorial claims and border disputes complicate the situation even further. Given complex ethnic mosaic in Central Asia, Soviet planners did not build administrative units along ethnic lines and took great care not to construct republics with strong ethnic identity which would allow them to eventually secede from the Soviet Union. As a result, thorny disputes as to whose territory was initially whose have occurred, burdened by the territorial exchanges. For example, Karakalpakstan began life in 1924 as part of Kazakhstan but in 1938 had been given away to Uzbekistan. Moreover, Uzbekistan, Kyrgyzstan and Tajikistan all have small enclaves on each other's territory which are nominally a part of their country but are geographically isolated. Only Kyrgyzstan has two Tajik enclaves, with population of some 30,000 people, and five Uzbek ones, with population of about 50,000 people. Issues related to them are highly divisive, and solving this problem appeared to be very difficult (ICG, 2002a). However, the process of delimitation of the borders has already begun. In 2000-2003, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan signed a number of border delimitation agreements and started works on delimiting the borders. By 2001, Kazakhstan and Uzbekistan have finally settled the border problems and exchanged disputed territories. Yet many issues, like the problem of the Uzbek enclaves in Kyrgyzstan, still remain unresolved.

In this context, the growing need to take into account all factors surrounding water disputes is apparent.

MEASURING WATER CONFLICT POTENTIAL

Water is the most politicised of all natural resources and it is more likely to become a source of armed conflict. It is no wonder therefore that such possibility has been widely discussed. Despite the growing literature on water and conflict, little work has been

done to provide arguments for the common thesis that "growing conflict over water looms ahead (Samson and Charrier, 1997). Generally, the Jordan and Nile basins are cited to give an example of international conflict prone basins. On the other hand, Wolf (1998) gave a historic evidence of co-operation between riparians and stated that the only recorded war over water was fought 4500 years ago between two Mesopotamian states, Lagash and Umma, in what is now southern Iraq. The same author pointed out at the "loose definitions in the terminology of the literature about water and conflict where "terms such as conflict, dispute, tensions, and war are regularly used interchangeably.

Nevertheless, in order to provide indication of potential water conflict, combinations of variables, or indicators, have to be developed. Undoubtedly, the practice of establishing various sets of indicators, including those for sustainable development, over the past decade has greatly influenced this idea. However, unlike indicators of sustainable development designed to communicate with the public at large to provide clear picture of a country's progress towards sustainable development, indicators of water conflict proneness are meant to serve as a 'yardstick' for decision makers who are involved in negotiations regarding specific river basin management.

Yet such 'limited' value does not impede the indicators of being used by international scientific and political community able to translate them into a pressure on the governments of the riparians involved in a dispute well before this would turn into a violent conflict. The use of Geographic Information System (GIS) makes such analysis even more effective by bringing together spatial and non-spatial variables, thus facilitating identification and interpretation of potential indicators.

One of the frequently cited instruments which could serve as a model for developing a set of water conflict indicators is the Index of Human Insecurity (IHI) developed to facilitate identification of vulnerable or insecure regions.

It is considered an "aggregate measure of human welfare that integrates social, economic, and political exposures to and capacity to cope with a range of potentially harmful perturbations (Lonergan, Gustavson and Carter, 1999).

The IHI identifies four key system components – the environment, the economy, society, and institutions. Within each of these four indicator categories are four variables, each of which measure either a key structural relationship (e.g., linkages, defining characteristics) or a key functional relationship (e.g., processes, flows) of the system.

Where data in a time series are missing, IHI developers utilize statistical techniques to establish a complete time series for all indicators and all countries, where there is sufficient initial data. However, the index for each year is specific to that year, making it difficult to compare changes in a country's IHI from across years (Yoffe and Ward, 1999).

Another water-specific indicator is water stress measured by Falkenmark's (1992) Water Stress Index (WSI) which divides the volume of a country's available water resources by its population. This measure, however, does not account for a country's ability to adapt to water stress, such as with more efficient irrigation technology. Ohlsson (1999) has developed a Social Water Stress Index (SWSI) to incorporate a measure of a country's adaptability. The SWSI is a water stress index (freshwater availability per capita) divided by UNDP's Human Development Index and then divided by 2 (rounded to nearest wholes). Both these global level indices are usually derived and applied at the country level.

Several other potential indicators were also mentioned in the literature, including overall population growth rates within a country, population density within and outside a basin, relative power and riparian position of countries within a basin (Wolf, 1999), the degree of democratisation of countries sharing a river basin and so on.

TESTING INDICATORS OF WATER CONFLICT

The methodology for establishing indicators of international freshwater conflict and co-operation was developed under Basins At Risk (BAR) project at Oregon State University, USA (Wolf, Yoffe and Giordano, 2003). BAR which has spanned for 4 years effectively developed and created legal and spatial framework to further evaluate international river basins at potential risk for future water conflict. All 263 international river basins were

delineated and a database documenting historical incidents of international water conflict and co-operation between 1948 and 1999 was set up. Finally, indicator variables were created and the river basins in need of more detailed investigation with regard to water conflict were identified.

Indicators have been selected in accordance with the following criteria: relevance to the selected framework; general availability of the data; existence of a theoretical or empirical link with security issue; and an adequacy of spatial and temporal coverage allowing for effective representation and modelling (Lonergan, Gustavson and Carter, 1999). Emphasis was made on the regional and basin scale indicators rather than on indicators of potential water conflict at global scale. Internationalisation of a basin was at special focus. Assuming that there is a causal link between the internationalisation of a basin and incidents of conflict among the states that now share that basin, the presence of ethnic minorities with nationalistic aspirations becomes a potential indicator (Wolf, 1999).

A key question regarding the above variables is whether they are relevant to indicating water conflict. Yoffe (2001) provides a good account of statistically testing indicators previously cited in the literature. As main statistical tool, linear regression was used to assess the relative strength of various independent variables in explaining the variability of the event data. Also, other statistical methods such as two-sample t-test were employed. Linear regression has been chosen because it offered a concise summary of the mean of the response variable as a function of an explanatory variable (Yoffe, 2001).

Sixteen indicators, including GDP per capita, population density, number of dams, water stress, HDI, hydropower have been tested using linear regression, three indicators such as freshwater treaties, adjacency and riverine contiguity have been analysed using two-sample t-test, and four indicators such as dam density, freshwater treaties, climate and precipitation had no statistical tests conducted on them due to structure of data.

Yoffe's most important finding was that most of the commonly cited water conflict indicators proved to be unsupported by the data. Neither government type, climate, IHI, water stress or number of dams, nor agricultural dependence on water resources and

energy needs showed a significant relevance with water conflict. Based on the assessment, river basins are at potential risk of freshwater conflict if:

- population density exceeds 100 people per 1 km^2
- per capita GDP is less than $765
- overall unfriendly relations (<-1 at water event intensity scale)
- there are politically active minority groups that may lead to the internationalisation of a basin
- large dams or other water development projects are planned
- no or limited number of water treaties is available (Yoffe, 2001).

This study will employ these indicator variables as the research framework.

ROLE OF GIS

A number of the attribute data mentioned above can be effectively represented within a Geographic Information System (GIS), such as ESRI ArcView, designed to capture, store, manipulate, analyse and visualize disparate sets of geographically referenced data. Moreover, some spatial information such as runoff and slope would be extremely difficult to analyse without the use of a GIS.

However, GIS has its limitations inherent to the technology, including problems of multiple scales and data interpretation. The examination of indicators at an international, national and sub-national level introduces questions of scale that will need to be further addressed. There is also a lack of distinct frameworks to analyse the interaction of human and environmental systems (Yoffe and Ward, 1999). Linked to the problem of frameworks is the problem with interpreting non-spatial matters using spatial analysis. For instance, the degree of democratisation of a country might be difficult to represent if one assumes that different areas have different levels of democratisation. Special problem regarding Central Asia's GIS is the lack of data; several important databases located in Tashkent, Uzbekistan, contain a lot of vital information but this information is virtually closed for external use.

Attempts at Applying Water Conflict Indicators to Central Asia

Previous attempt to apply potential indicators of water conflict to Central Asia's water disputes has been made by Myers (1993) who created a water scarcity index using population and per capita water availability data. Assuming that water stress is to occur when more than 2,000 people share every unit of one million cubic meters of available water, the author calculated water indices for each of Central Asia's countries by comparing 1991 population data with all available water and the amount of water available solely from indigenous sources (i.e. that available from precipitation within the borders of a country). In 1993, all the countries appeared to have sufficient water resources per capita. Both downstream countries of Turkmenistan and Uzbekistan relied on water flowing in from outside and indigenous water resources stress was high (2,180 people per one million m^3 of indigenous water in Uzbekistan and 3,287 people per one million m^3 of indigenous water in Turkmenistan).

Klötzli (1994) used a number of indicators for vulnerability to water scarcity developed by Gleick (1993), including the ratio of water demand to supply, the per capita availability of water, the dependence on imported surface water and the importance of hydroelectric production. Having calculated these, the author came to a somewhat obvious conclusion that "these indicators show a distinct difference between the water-rich republics of Kyrgyzstan and Tajikistan, and the republics not controlling the sources of water courses like Uzbekistan and Turkmenistan The vulnerability indices not only express different access and pollution control opportunities, but also different, often contradictory modes of water utilisation (hydropower vs. agriculture) (Klötzli, 1994). Similar method based on Gleick's findings was used by Smith (1995) to determine the relative degree of dependence of particular regions on water resources and to identify those regions that may become potential focal points for future intra- and interstate conflicts. It is argued that high population growth can be more damaging to the environment than high population density and southern Uzbekistani provinces as Surkhandarya and Kashakdarya and several regions in the Ferghana Valley that experienced some

of the highest population growth rates in the region between 1981 and 1991 are most likely to become a scene of a resource-related conflict. The author points out that the areas combining high population growth and no indigenous water supplies (Andijan and Ferghana in eastern Uzbekistan, Karakalpakstan in the west) are of prime concern. As Turkmenistan's Dashhovuz region and Uzbekistan's Karakalpakstan share the water of the lower Amu Darya, future water-induced conflicts may occur in this region. Each region was ranked according to the basic characteristics believed to affect the water conflict potential (population growth rate/density, per capita water availability from total and indigenous sources, share of water derived from external sources, minority population share of total population). Eight of ten regions having the highest rankings for water-resource vulnerability are located in Uzbekistan, with top of the top four located in the Ferghana Valley. Thus, the regions constituting the Ferghana Valley and those occupying the lower Amu Darya appear to be the most sensitive to potential water-induced conflicts.

Carney and Moran (2000) examined the interstate affect in Central Asia toward Russia, i.e. "the current discernable feeling of a government toward another government which is expressed "…in all behaviour whether it takes the form of word or deeds, and developed "scale of affectivity ranging arbitrarily from -2 to +2. Although different in goals, this study employed the similar technique in scoring and coding news reports from Foreign Broadcast Information Service (FBIS).

Also mentioning the Aral Sea Basin's famous conflict potential, Yoffe (2001) and Wolf, Yoffe and Giordano (2003) argue that the basin countries tend to negotiate current conflicts. However, none of the treaties signed recently include all the basin riparians, and therefore potential for continued disputes, at least in the nearest future, is likely.

Given global scale of BAR project, considering and spatially interpreting all physical, social, economic and political variables for Central Asia becomes even more vital and can provide solutions based on a more holistic approach to natural resources, while recognising the historical, geopolitical and natural characteristics of the region.

WATER EVENT INTENSITY SCALE

Wolf, Yoffe and Giordano (2003) recount of compiling a systematic database for water conflict/co-operation worldwide, in an attempt to gather every reported interaction between two or more nations, where water was the driver of the event. Using various international news databases, like FBIS and its online version, World News Connection (WNC), the authors developed 'a friendship-hostility scale' – a ratio of all co-operative to conflictive events between nations over water, having modified a scale created by Conflict and Peace Databank (COPDAB) project directed by Professor Edward E. Azar.

COPDAB's scale ranges from level 1, representing the most co-operative events, to level 15, representing the most conflictive events, with level 8 representing neutral events. To make it water-specific, the authors inverted it so that neutral events were centred on zero, to make it ranging from -7 to +7, with -7 denoting the most conflictive events, 0 denoting neutral events, and +7 denoting the most cooperative events. The new scale also included the addition of water terms, and a new category, "formal declaration of war." To accommodate this category, which is not part of the original COPDAB Scale, category 13 (Small scale military acts) and 14 (Limited war acts) were merged into one category, number 13. Category 14 was given the heading and description of category 15 (Extensive war acts causing deaths, dislocation or high strategic costs), and Category 15 was changed to indicate a formal declaration of war (Yoffe, 2001).

For the purposes of this study, BAR global Water Event Intensity Scale is adapted to the Amu Darya basin countries in Central Asia to determine overall relations and identify focal points for the future conflicts while concurrently applying GIS-based variables of water conflict.

Aggregating Data for the Amu Darya Basin

In creating ArcView data coverages for the Amu Darya Basin, data for international river basins kindly provided by Dr Aaron T. Wolf was used which was then matched to the US Geological Service Hydro1k (USGS, 2000) dataset, a global coverage of streams and drainage basins derived from digital elevation data. The data

collected fell into roughly two categories: biophysical (e.g. runoff, population, dams) attributes suitable for the spatial analysis and economic/political (e.g. GDP per capita, overall relations, ethnic minorities) attributes. Although some of the variables used are quantitative and can be measured, the indicators comprising political category are qualitative in nature (internationalisation of a basin, future water infrastructure, water treaties).

Population

In pulling various water-related attributes together in order to draw a picture of a basin's specific conflict proneness, population growth is among key factors for assessing water scarcity. The relation of water access to population distribution should therefore be assessed. As a river basin rarely follows political borders, per basin population density instead of per region population density was evaluated. In doing so, the Landscan gridded population of the world (Landscan, 2001) was used to approximate population distribution. Building on the Landscan data proved very effective as the Landscan team used remotely sensed slope, land cover, road proximity and night time lights to refine the GIS-based gridded population cell values, providing the best accurate dataset. Gridcell values for the Aral Sea Basin were summed to combine this table with the Amu Darya Basin, thus calculating a population density for that area, as described by Yoffe (2001).

Runoff

Runoff is considered the total amount of surface flow in a given area. Any assessment of a water resource related issue would be incomplete without some approximation of water availability within the study area (Yoffe, 2001). Data for the Amu Darya runoff were obtained through a spatial resolution grid of composite runoff fields based on observed river discharge and simulated water balances (Fekete, Vörsmarty and Grabs, 2000). The project was the outcome of a joint effort of the Complex Systems Research Centre at the University of New Hampshire and the Global Runoff Data Centre in Koblenz, Germany. The project combined "…two sources of information (observed discharge and simulated runoff) to estimate continental runoff which was "the most reliable assessment at present (Fekete, Vörsmarty and Grabs,

2000). To estimate the composite runoff for the Amu Darya, runoff data for the eight gauging stations located in the Amu Darya basin were used. The cell values in mm/yr were multiplied by the area of the associated grid cell in sq. km to produce a runoff volume grid ($mm*km^2/yr$).

Dams

The third key factor in assessing water scarcity is the number and density of dams in a study area. According to Yoffe (2001) and Wolf, Yoffe and Giordano (2003), when statistically testing potential water conflict indicators, dams themselves did not appear to be a potential indicator for water conflict, yet in basins without water treaties lower dam density basins tended to exhibit slightly less conflict. With negative overall relations between countries and absence of a transboundary institution, unilaterally setting a large dam or diversion project can provide a context for the conflict over water, while positive relations and presence of a transboundary institution can mitigate the situation. To determine the number of dams and dam density for the Amu Darya Basin, global dataset provided by Wolf was used, based on the Digital Chart of the World data and International Commission on Large Dams (ICOLD) World Register of Dams. More importantly, large proposed water infrastructure projects that proved to have significant influence on the whole water situation in the basin were identified (e.g. the Rogun Dam in Tajikistan, etc.).

Minority Groups

Internationalising a basin provides an important setting for future water conflict (Wolf, Yoffe and Giordano, 2003). Those basins whose management institutions were developed under a single jurisdiction and then became divided among two or more nations when that jurisdiction suddenly collapsed, showed much higher levels of conflict (Yoffe, 2001).

In order to check for the active nationalist movements who might cause future internationalisation of the Amu Darya Basin, data from two major sources have been analysed: Minorities At Risk Project, at the University of Maryland's Centre for International Development and Conflict Management (Gurr, 2000) and Unrepresented Nations and Peoples Organisation (UNPO, 2002).

GDP

Low per capita GDP (< $765/person according to the World Bank lowest income country definition) was identified to be one of the indicators of conflict over water (Yoffe, 2001).

As Wolf, Yoffe and Giordano (2003) put it, the higher the per capita GDP, or the lower population density, the greater the co-operation – barely. To establish macro-economic data for the Amu Darya Basin countries, the World Bank data for 2000 were used.

Overall Relations

It is pointed out (Yoffe, 2001) that countries that co-operate in general also co-operate over water, and countries with overall unfriendly relations are also unfriendly over water issues.

To construct a 'friendship-hostility scale' as appeared in Wolf, Yoffe and Giordano (2003), a rough water event intensity scale was built employing the technique.

In gathering country-to-country events and interactions, two major sources were used: the WNC and Transboundary Freshwater Dispute Database.

Both build on the reports about Central Asia by the two leading Russian news agencies – ITAR-TASS and Interfax, as well as on the news coverages by Eurasianet and the Mashhad Voice of the Islamic Republic of Iran (Tajikistan news). Notably, the water event data are based on public reports and therefore lack reports on non-public co-operation ("picnic table talks, non-official visits, etc.)

Freshwater Treaties

Generally, freshwater treaties mitigate conflict, and no or limited freshwater treaties for a basin increase the likeliness of conflict over water. To analyse existing freshwater treaties for the Amu Darya Basin, the International Freshwater Treaties Database at Oregon State University (TFDD, 2002), containing a full text of over 400 international freshwater related agreements, was used.

THE DISPUTE AND PROCEEDINGS

This is the first time a dispute under the IWT has been referred to a Court of Arbitration. In its Request for Arbitration, Pakistan

identified two questions: first, whether India's proposed inter-tributary transfer as part of the KHEP breached its obligations under the IWT, as interpreted and applied under international law (First Dispute); and, second, whether the IWT allowed India to deplete the reservoir level of a run-of-river plant below the "Dead Storage Level" in circumstances other than unforeseen emergencies.

To answer these, a Court of Arbitration was constituted on December 17, 2010. In June 2011, Pakistan submitted an application for provisional measures, leading to an Order on Interim Measures by the Court on September 23, 2011. Subsequently, the Court undertook two site visits and oral hearings on the merits were held at the Permanent Court of Arbitration in.

The Hague from August 20-31, 2012. The Partial Award of February 18, 2013 allowed India to proceed with the construction and operation of the KHEP, subject to certain operational constraints to be determined in the Final Award. While both Parties agreed that the awards should be published, Pakistan opposed the publication of the pleadings.

The Award

The First Dispute concerned the permissibility of India's KHEP and the inter-tributary transfer under the IWT. The IWT obliges India to "let flow" the waters of the Western Rivers, except for limited, enumerated uses. In the Court's view, these exceptions give India the right to utilize the Western Rivers in some ways, subject to its obligations under the IWT.

The Court began by considering India's general obligations under Articles III and IV(6) of the IWT. Pakistan argued that, since the power generated by the KHEP would be supplied to the whole of India's northern electricity grid, the Project did not conform with Article III(2), restricting India's use of the Western Rivers to "the drainage basin thereof." The Court disagreed: though Article III(2) imposed a geographical restriction on India's use of the Western River waters, such a restriction did not extend to the products (such as electricity) generated from the use of these waters. Pakistan also argued that, by failing to adequately assess the environmental impact of the inter-tributary transfer, India breached its general obligation to "use its best endeavours to maintain the natural channels of the Rivers" under Article IV(6).

Although noting that Article IV(6) was obligatory, the Court considered it of no direct relevance as it only required the preservation of the natural, unobstructed paths of the rivers, and not the volume or timing of the flow.

Next, the Court turned to Pakistan's arguments of the IWT prescribing requirements for the design and operation of run-of-river plants. Pakistan contended that, first, permit the permanent diversion of a tributary; second, even if such diversion was permitted, the KHEP did not qualify as a "Plant" under Paragraph 15(iii); and, finally, even if the KHEP was a "Plant," it failed the test of necessity contained in Paragraph 15(iii).

The Court rejected all three arguments. It found that the plain text of Paragraph 15(iii) allowed inter-tributary transfers, provided that the diverting works complied with three conditions. First, the work must be a run-of-river plant. The Court noted that the KHEP was designed and notified to Pakistan as a run-of-river plant. Second, the plant must be "located on" a tributary of the Jhelum. Pakistan pointed out that the actual electricity generation was to take place at a distance of 23 kilometers from the Kishenganga. The Court however saw no reason for "disaggregating the elements" comprising the KHEP, designed to operate as an "integrated whole," and concluded that the condition was satisfied since the works that trapped the water were "located on" the Kishenganga" a tributary of the Jhelum.

Finally, the Court noted that Paragraph 15(iii) required the diversion of water into another tributary to be "necessary" for generating hydroelectricity. On the threshold for necessity, the Court considered "inapposite" the concepts of necessity developed in other branches of international law, such as international trade law, investment law and the law of State responsibility, adopting instead the plain meaning of "necessary" to describe action that was "required, needed or essential." Against this threshold, it found that the diversion was necessary for India to utilize the difference in elevation between the two tributaries in order to generate significant power.

The Court next turned to the "essence" of the First Dispute: the requirement under Paragraph 15(iii) that any Indian inter-tributary run-of-river plant operate "only to the extent that the

then existing Agricultural Use or hydro-electric use by Pakistan on the former Tributary would not be adversely affected." Pakistan argued for an "ambulatory" interpretation of "then existing use" in Paragraph 15(iii), calling for a "dynamic assessment by India of the agricultural and hydro-electric uses of Pakistan whenever water is released by the KHEP." By contrast, India argued for a "static" approach, focusing on a "critical date," when India communicated to Pakistan its "firm intention" to proceed with a project, such that Pakistan's agricultural and hydroelectric uses must be "frozen" at the stage when design was finalized. In answering whether the NJHEP constituted "then existing use" by Pakistan, which restricted India's right under Paragraph 15(iii), the Court did not accept either interpretation in entirety. With respect to Pakistan's approach, it noted that the "overall structure" of that "the general permissibility of any new Plant's design is determined prior to the commencements of its construction." It ultimately rejected Pakistan's interpretation because it would subject the viability of India's works to the "unilateral will and action of another party."

With respect to India's approach, the Court considered that, in practice, it could be "very difficult to pinpoint" the exact moment at which a firm intention to proceed with a project crystallizes, keeping in mind the "continuum of design, financing, government approval, construction, completion and operation" associated with large infrastructure projects such as the KHEP. Instead, the Court proposed a "'critical period,' wherein a cumulation of facts â€" tender, financing secured, government approvals in place and construction underway â€" has achieved a level of certitude indicating that a project will proceed 'firmly' as proposed." Applying this "critical period" approach to India's KHEP and Pakistan's NJHEP, it found that the KHEP preceded the NJHEP such that the NJHEP did not constitute a "then existing use" by Pakistan. India was therefore permitted to effectuate an inter-tributary transfer under Paragraph 15(iii).

However, the Court accommodated elements of the dynamic approach by subjecting India's right to operate the KHEP to certain operational constraints. In doing so, it recognized that India's rights to divert water for the operation of the KHEP are "tempered"

by Pakistan's right to a minimum flow of water for hydroelectric and agricultural uses. The Court observed that Paragraph 15 "delineates a number of operational constraints" for new works and seems to be "operational in character," such that the Treaty imposed a duty on India to ensure that a minimum flow of water reaches Pakistan at all times.

The Court also found support for such a duty in "contemporary customary international law," which requires States to take "environmental protection into consideration when planning and developing Projects that may cause injury to a bordering State." Acknowledging that the IWT must be interpreted and applied in light of the "customary international principles for the protection of the environment in force today," the Court noted that general international law imposes a duty on States "to prevent, or at least mitigate" significant harm to the environment when pursuing large-scale construction activities.

Crucially, it recalled the International Court of Justice's observations that the "duties of due diligence, vigilance and prevention" imposed by the principle of sustainable development continue "once operations have started and ¦ throughout the life of the project." It acknowledged that India recognized this continuous duty by committing to ensure a minimum downstream flow of water. However, the information presently at its disposal did not allow the Court to objectively fix the exact rate of the minimum downstream flow, and it requested the Parties to provide the relevant information to fix this rate in its Final Award.

Second Dispute

Although Pakistan framed the Second Dispute as relating to the permissibility of reservoir depletion in the abstract, the Court noted that Pakistan in essence took issue with the use of a sediment management technique called "drawdown flushing" by India at the KHEP and other future projects. It clarified that while its findings could not reverse the Neutral Expert's 2007 Determination (permitting this technique for India's *Baglihar* project), or retrospectively affect any plant already in operation or under construction, they would apply to the KHEP and any future Indian run-of-river plants on the Western Rivers.

India put forth two objections to the admissibility of the Second Dispute. First, it argued that except when the two Permanent Indus Commissioners were in agreement to pursue an alternative, the IWT required a Neutral Expert to initially determine whether a matter was a technical "difference" or a "dispute" to be referred to arbitration. With respect to Pakistan's claim, no such initial determination was made. Second, in India's view, the subject matter of the Second Dispute was objectively among the questions consigned to a Neutral Expert. The Court dismissed both objections. In its view, the text of Article IX(2)(a), as confirmed by its object and purpose, did not impose "an additional procedural hurdle" to access the arbitral process, and it was not open to India to assert at this late stage that the Second Dispute was a "difference" and not a "dispute."

Looking at the treaty context, the Court noted that several provisions strongly suggested that some limitation on India's use and depletion of dead storage" a consequence of drawdown flushing technique" was intended. Specifically, it identified a "decisive prohibition" in the Treaty against the depletion of dead storage, except in unforeseen emergencies. Noting that both Parties agreed that sediment accumulation did not constitute an unforeseen emergency, the Court concluded that the text of the Treaty prohibited the depletion of dead storage for drawdown flushing. Next, the Court juxtaposed its understanding of the limitations on the use of dead storage with another object of the Treaty: to allow India to harness the hydroelectric potential of the Western Rivers. Agreeing that "anything you build needs to work," it considered whether drawdown flushing was indispensable to the sustainable generation of hydroelectricity on the Western Rivers. Based on the evidence, it concluded that India's right to utilize the Western Rivers could be "meaningfully exercised without drawdown flushing." In particular, the Court suggested the use of another technique called "sluicing" for sediment management.

WATER CONFLICTS IN THE KRISHNA BASIN

The east flowing krishna river originates in the mahadev range of the western ghats, north of the hill station of Mahabaleshwar in Maharashtra, and after flowing over a distance of about 1,40(1 km it meets the Bay of Bengal, south of Vijayawada. In between

its origin at 1,337 metres above the MSL and its delta, the river fows across the entire width of the Indian peninsula through the states of Maharashtra, Karnataka and Andhra Pradesh.

The Krishna river is joined in its course by a large number of tributaries, big and small, draining a total basin area of about 256,000 sq km of which the share of the three riparian states of Maharashtra, Karnataka and Andhra Pradesh is 26.8 per cent, 43.8 per cent and 29.4 per cent, respectively. The basin drains a length of approximately 700 km of the Western Ghats which is the predominant source of water of the river. As the river flows about 135 km from its origin near Mahabaleshwar Hills, it is joined by the Koyna river flowing from the western side of the same hill. Further along its course. it is joined by tributaries like Varna, Panchaganga and Dodhganga draining about 150 km of the Western Ghats. As the river emerges from the eastern slopes of the Western Ghats, it is joined by Ghataprabha and Malaprabha from the south at a distance of approximately 500 km from the origin.

After traversing the Deccan proper the east flowing Krishna then enters the alluvial lands and at a distance of about 800 km from the source, just before it enters Andhra Pradesh, a major tributary Bhima, draining the Western Ghats, north of Mahabaleshwar joins it from the north. Near Kurnool the river is joined by another major tributary, Tungabhadra from the south, draining a major section of the Western Ghats in Karnataka. Within a short distance from this confluence, the river enters the Naliamali Ranges characterised by peep gorges. At this place the Srisailam Dam and further downstream the Nagarjunasagar Dam have been constructed. At this point the major water sources of the Western Ghats have all been united. Tributaries like Dindi, Musi, Palleru and Muneru draining the dry north-eastern parts of the basin join the river between Srisailam ad Vijayawada but do not add much water. Below Vijayawada, where the Krishna is blocked by the barrage constructed during the British period, the river spreads out into the delta and below the last major village Nagailanka it joins the Bay of Bengal in three branches, thus ending the long eastward journey of the waters of the Western Ghats.

Since water flow creates an interconnectedness within the basin, each intervention in land and water use, depending on its

scale, can become the source of conflicts. The mining of iron ore at Kudremukh and Manganese ore in Sandur in the upper catchments of Tungabhadra has seriously affected the stability of the catchment and has led to severe soil erosion and silting of the Tungabhadra reservoir, thus conflicting with irrigation needs. The Krishna river system has a large number of small, medium and major dams starting from Dhom which is located within 5 km of its origin.

This storage and diversion of water from the original river course has destroyed the fishing economy which was dominant on both banks of the river as well as the indigenous irrigation system that existed throughout the course of the river. Further, large dams have also generated conflicts by creating waterlogging in the command areas. The hydroelectric power generation from the river water has come into conflict with irrigation needs both in terms of the spatial and temporal characteristics of water storage and distribution. The maximisation of power generation from Koyna demands that the water of the Krishna basin, draining into Bay of Bengal, be diverted to the Arabian Sea.

Industrial uses of the river system are a major source of conflict. For example, the pulp based industries on Tungabhadra have polluted the river and destroyed the fishing economy 20 km downstream. Moreover, the large-scale cultivation of pulpwood species like Eucalyptus in this part of the basin has impaired the groundwater recharge potential.

In the Krishna basin comprising mostly of arid and semi-arid regions water management had reached a high level of sophistication, both for surface as well as groundwater utilisation. An aerial view of the basin reveals a network of a large number of tanks, some pre-historic, others constructed by the local people or the rulers at different times in history. In general the technology used for all these tanks involved the construction of an earthen embankment at the exit of a natural water collection point that is a result of topography.

These tanks were used for surface irrigation of approximately 500 acres of land as well as for enhancing ground water recharge to support the wells. These tanks formed a network so that water did not drain out easily and was conserved at the site. To some

extent indigenous water management techniques also included the diversion of streams to irrigate land by canals. The total number of tanks in the basin may be around 30,000. By arresting the scanty rainfall, these tanks actually provided a cushioning effect against variations in rainfall which is common in the basin. This decentralised water conservation system met both drinking water and agricultural needs. There was no major long distance transfer of water and the local cropping pattern evolved in accordance with the local water endowment.

The needs of the Vijayanagar Empire led to the first major intervention in the natural water flow. In the sixteenth century, specially during the reign of King Krishnadevaraya, there were many attempts to divert the water of Tungabhadra through seven canals in the Bellary district, these are now known as the Vijayanagar Canals.

The canals provided water for irrigation as well as satisfied the needs of the large army stationed in the capital city of Hampi. The interests of the Vijayanagar rulers were not limited to canals. Understanding the crucial role of tanks in food production as well as in providing drinking water supply, the kingdom undertook a systematic programme of tank construction. The Daroji tank and the Vyasayaraya Samudram in Cuddapah district are the result of this programme.

The first large-scale intervention in the natural flow of water in the Krishna river basin was seen in the late nineteenth century. It was motivated both by the irrigation needs of export crops like cotton and groundnut, as well as for transporting these products easily to major ports like Madras.

The Krishna delta canal system based on the Vijayawada barrage was constructed in 1855 The Nira Canal in Maharashtra was constructed in 1835 to irrigate about 150,000 acres and the Kurnool Cuddapah Canal was constructed in 1886 to irrigate 100,000 acres. With the passage of time. an increasing number of government aided large and medium projects came up and today the Krishna river has numerous dams including the Dhom Dam which is at a distance of 5 km from its source. Midstream, we find the Alamatti and Narayanpur Dams of the Upper Krishna Project while further downstream Srisailam and Nagarjunsugar Dams

generate electricity and divert water for irrigation. The tributaries have also been used extensively in this respect.

The Koyna Dam is situated 58 km below the origin of the river. The Tunga river is impounded at Gajanur and Bhadra at Lakavalli. The Tunga and Bhadra meet and the Tungabhadra Dam is located 265 km from the origin. In Ghataprabha the reservoir at Hidkal in Karnataka is the major irrigation project while Malaprabha is impounded at the peacock gorge near Manoli. The spread of water-intensive cultivation throughout the basin has dramatically altered the water balance, leading to major conflicts between water for cash crop cultivation and staple food production on the one hand, and between irrigation and drinking water needs on the other. The case of sugarcane cultivation in Maharashtra and grapes in Hyderabad are two instances of over-exploitation of water resources in the basin for cash crop production and a consequent destabilisation of the water cycle, leading to water scarcity in large parts of the basin.

Dams for irrigation and/or power are also a source of conflict between the traditional rights of people to land and water and the rights of the state to displace and uproot them for building river valley projects as in the case of Srisailam Dam. Large dams require massive submergence areas, and hence necessitate the displacement of large numbers of people. Big dams also allow large diversions of water. Major diversions from the river basin as in the case of the Telugu-Ganga Canal taking off from Srisailam Dam, affect the riparian rights of the states and have generated unresolvable inter-state conflicts.

FUNDAMENTAL WATER ISSUES BETWEEN PAKISTAN AND INDIA

There is growing feeling in Pakistan that while India is increasingly building dams on its western rivers, it is simultaneously engaged in activities aimed at stopping Pakistan, the lower riparian, from building storage dams on Pakistani rivers. In the case of its upper riparian neighbour, Nepal, India has even deployed heavy artillery to partially destroy dams which were being constructed by the Nepalese. India's water strategy thus boils down to construction of more and more dams on cross-

boundary rivers inside its own territory while obstructing dams in lower- riparian neighbours and destroying those in upper-riparian Nepal.

Honorary vice-president of the International Commission on Large Dams (ICOLD), Asif H. Kazi in his column titled "Misusing the Indus Treaty" argues that: "Pakistan's farmlands have been deprived of the uses of the waters of three eastern rivers, Ravi, Beas and Sutlej. The flows of these rivers were allocated to India under the 1960 Indus Waters Treaty. Authorities on the subject accept that when rivers and canals in Pakistan's demarcated area were classified as Pakistan's assets under the Partition Act, 1947, it meant only one thing: that these rivers and canals were to continue to receive water in the same way as before. Under the treaty, Pakistan was to enjoy the unrestricted use of the Indus, the Jhelum and the Chenab. However, exceptions were inserted as annexure which allowed India to develop and use certain specified quantities of water of the three western rivers as well".

Indian storage limits on the western rivers, which add up to 3.6 MAF (million acre feet). However, India deliberately followed a pattern of filling water behind Baglihar Dam constructed on the Chenab River by impounding flows in the low-flow month of September, a clear breach of the treaty which prescribes the filling period as being from June 21 to Aug 31 (Ibid).

Obviously, the foregoing was not the intent of the Indus Waters Treaty. And it is precisely for this reason that Pakistan has been insisting that India adopt well- known dam design features, especially for the outlets, which can easily ensure that the reservoir operators would not be able to manipulate flows of the western rivers at their own sweet will. India is opposing this using as an excuse the need for the prolongation of the reservoirs' lifespan through sediment flushing (Ibid).

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Major Environmental Issues

GEOGRAPHICAL PERSPECTIVE OF ENVIRONMENTAL ISSUES

Environmental issues in India include various natural hazards, particularly cyclones and annual monsoon floods, population growth, increasing individual consumption, industrialization, infrastructural development, poor agricultural practices, and resource mal distribution have led to substantial human transformation of India's natural environment. An estimated 60% of cultivated land suffers from soil erosion, water logging, and salinity. It is also estimated that between 4.7 and 12 billion tons of topsoil are lost annually from soil erosion.

From 1947 to 2002, average annual per capita water availability declined by almost 70% to 1,822 cubic meters, and over exploitation of groundwater is problematic in the states of Haryana, Punjab, and Uttar Pradesh. Forest area covers 19.4% of India's geographic area (637000 km^2). Nearly half of the country's forest cover is found in the state of Madhya Pradesh (20.7%) and the seven states of the northeast (25.7%); the latter is experiencing net forest loss. Forest cover is declining because of harvesting for fuel wood and the expansion of agricultural land. These trends, combined with increasing industrial and motor vehicle pollution output, have led to atmospheric temperature increases, shifting precipitation

patterns, and declining intervals of drought recurrence in many areas.

The *Indian Agricultural Research Institute* has estimated that a 3 °C rise in temperature will result in a 15 to 20% loss in annual wheat yields. These are substantial problems for a nation with such a large population depending on the productivity of primary resources and whose economic growth relies heavily on industrial growth. Civil conflicts involving natural resources—most notably forests and arable land—have occurred in eastern and northeastern states. By contrast, water resources have not been linked to either domestic or international violent conflict as was previously anticipated by some observers. Possible exceptions include some communal violence related to distribution of water from the Kaveri River and political tensions surrounding actual and potential population displacements by dam projects, particularly on the Narmada River

MAIN FEATURES OF THE ENVIRONMENTAL CRISIS

At this point, a very brief overview of the environmental crisis may be helpful. It is important to emphasise that a wide range of views about the nature and severity of the current environmental crisis exists, and some of the issues are highly controversial. Nevertheless, there is broad agreement that the environmental crisis encompasses the following main issues.

Climate change: anthropogenic climate change due to pollution of the atmosphere by greenhouse gases (and other contaminants) is now regarded as one of the major global environmental issues. It occurs largely as a result of the combustion of fossil fuels, emissions from agriculture and pastoralism, and land-use changes that accompany the destruction, clearance and burning of forests. Climate change already has observable ecological and social effects, and its projected impacts could potentially result in profound changes in global mean surface temperature, sea level, ocean circulation, precipitation patterns, climatic zones, species distributions and ecosystem function.

Stratospheric ozone depletion: the depletion of stratospheric ozone due to the pollution of the atmosphere by halocarbons (such

as chlorofluorocarbons, or CFCs) is another serious environmental issue. It is a significant concern because the lack of protective ozone at high altitudes results in increased levels of harmful solar ultraviolet (UV-B) radiation reaching the earth's surface, causing a range of health-related and ecological impacts.

Degraded air quality: other forms of air pollution are also significant, particularly at regional and local scales, as they may seriously degrade air quality; worldwide, approximately one billion people inhabit areas - mainly industrial cities - where unhealthy levels of air pollution occur. Many air pollutants are responsible for the degradation of air quality, but some key pollutants include particulate matter (such as soot), tropospheric ozone, oxides of nitrogen, oxides of sulphur, lead and various aromatic compounds (such as benzene). Many air pollutants may cause or aggravate respiratory and cardiovascular illnesses; some are known carcinogens; and some can cause damage to vegetation and, in turn, produce a range of ecological effects.

Degraded water quality: similarly, water quality can be seriously degraded by contamination with pollutants, giving rise to a range of health-related and ecological effects (such as the degradation of coral reefs). A major source of water pollution is the terrestrial run-off to inshore waters that occurs in many coastal locations; such run-off may contain significantly elevated levels of nitrogen and phosphorus from agricultural land and from human settlements. Many other human activities lead to water pollution, including mining and industrial processes, which may create toxic effluent. Oil spills, accumulation of plastics and the bioaccumulation of persistent organic chemicals are some of the other causes of serious degradation of the marine environment.

Scarcity of fresh water: besides the pollution of freshwater sources, there are a variety of other reasons for the scarcity of fresh water for drinking in many parts of the world - many of which are related to poor water resource management practices. For instance, the over-abstraction of water from rivers results in water shortages and problems of salinisation downstream. Irrigation practices may also be responsible for the depletion of local water sources and the salinisation of irrigated land. Vast differences in water security exist at the global scale, reflecting both demand for

fresh water and the scale of public and private investment in water supplies, treatment and distribution.

Land contamination: land contamination occurs as a result of chemical or radioactive pollution, especially by long-lived (persistent) chemical species that enter the soil. Land contamination may cause profound ecological effects and it presents severe constraints to development, since contaminated land must typically be rehabilitated before it is safe to use for agriculture, construction or recreation.

Deforestation: it has been estimated that around half of the world's mature forests have been cleared by humans. Deforestation occurs for a variety of reasons, but the majority of deforestation now occurs when tropical forests are cleared for agriculture and pastoralism; other reasons include the destruction of trees for charcoal production and the selective logging of forests for timber. Whilst tropical forests cover only around 6% of the earth's surface, they are an essential part of the global ecosystem and of the biosphere: they help to regulate climate; they protect soils from erosion; and they provide habitats for a vast number of plant and animal species. One estimate suggests that around 90% of the world's species are found in tropical forests (Park 2001).

Soil erosion and degradation: concerns about soil erosion, soil degradation and the problem of desertification have become acute. In part, these concerns are based on the historical experiences of dramatic soil erosion and transport in New World countries including the USA (during the 'Dust Bowl' of the 1930s) and Australia. Whilst analyses of the problems of soil erosion and degradation have become more sophisticated, recently, it is clear that these problems continue to have important consequences for agricultural and pastoral productivity as well as for the functioning of natural ecosystems.

Land use change and habitat loss: these issues overlap with others, such as deforestation, but they are broader and include the clearance of forest for agriculture and pastoralism, the transformation of land during urban growth, the development of new infrastructure (such as roads), the drainage of wetlands, and the destruction and removal of coastal mangrove forests. Biodiversity loss: many plant and animal species are threatened

with extinction, due to the spread of disease, the destruction and degradation of their habitats, and direct exploitation. In 1999, UNEP (1999) estimated that one-quarter of the world's mammal species and around one-tenth of the world's bird species faced a significant risk of total extinction. Threats to biodiversity are not confined to terrestrial ecosystems; serious concerns have been raised about the future of marine and coastal wildlife species as a result of the pollution, over-exploitation and acidification of ocean and seas.

UNDERSTAND THE NATURE OF THE ENVIRONMENTAL PROBLEMS

Environmental destruction by the rich

To understand the nature of the environmental problems in India, it may be useful to compare and contrast certain environmental trends and concerns in India with those in the West, especially since the environment crusade began in the West and since many groups in India, including political parties, have for long dismissed it as a petty Western concept. The argument has always been that too much concern for the environment can only retard economic and industrial development. The UN Conference on the Human Environment held in Stockholm in 1972 was the landmark conference that created worldwide consciousness about environment. No UN conference has ever been able to collect so many luminaries at one place. Many delegations from developing countries had argued that the solution to environmental problems lay in economic development. "Smoke is a sign of progress," the Brazilian delegation had thundered, then representing a country witnessing an economic boom. India's Prime Minister Indira Gandhi, who made a major impression on the conference, is still remembered for her oft-quoted statement: "Poverty is the biggest polluter." In all those who came from the Third World, both leftists and rightists, there was a sneaking suspicion that the Western countries were up to some trick.

The West may simply be pushing the environmental concern onto an unsuspecting Third World to retard its technological modernisation and industrial development. It was even argued that having got their riches and their affluent lifestyles, Westerners

were now simply asking for more affluence: clean air, clean water and large tracts of nature for enjoyment and recreation, many of which were going to be preserved in the tropical forests and savannas of Asia, Africa and South America. But exactly 10 years later when the UN organised a meeting to commemorate the Stockholm conference, few non-governmental groups from the Third World were prepared to argue in favour of the development process as it is.

The Third World today faces both an environment crisis and a development crisis, and both these crises seem to be intensifying and interacting to reinforce each other. On one hand, there does not seem to be any end to the problems of inequality, poverty and unemployment, the crucial problems that the development process is meant to solve. On the other, environmental destruction has grown further apace. But what is interesting is that while many environmental problems, expecially those related to air and water pollution have tended to become less severe in many parts of the industrialised world, because of the introduction of highly capital-intensive pollution control technologies, these problems have continued to grow and become critical in many parts of the developing world.

In other words, while the economic development process in the world is only worsening our environmental problems, it is tending to solve them in the West. Michael Heseltine, then minister of environment in the anti-environment British government of Margaret Thatcher, even went so far in a UN meeting in 1982 as to say that all environmental problems in the West have been solved and they now remain mainly in the Third World! Heseltine, indeed, had a point. London, for instance, has not seen for years any of those smogs it saw regularly in the 1940s and '50s, which led to thousands of deaths, and the Thames now even boasts of salmon. But Michael Heseltine, like all representatives of vested interests, was only hiding something of deep significance: the role of the Western world in destroying the Third World's environment. Very simply speaking, the major environmental problems in the West are those arising out of waste disposal — problems of air and water pollution and of disposal of highly toxic industrial and nuclear wastes. Though problems of acid rain have definitely

increased and there does not yet seem to be any solution to the problem of toxic wastes, it is true that some cities and rivers do look cleaner. In the Third World, however, as its own industrialisation proceeds, these waste disposal problems are getting worse day by day but they are still not the major or the only environmental problem.

In the Third World, the major environmental problems are those which arise out of the misuse of the natural resource base: the soils, forests and water resources. These problems are created to a great extent because of the pressure to produce raw materials for modern industry. The Third World's environment not only provides raw materials for its own industries but also for the industries of the West. For instance, the Japanese and Western timber industries have been the biggest source of forest destruction in Southeast Asia. Having turned countries like Thailand from net exporters into net importers of wood, Japanese companies are now turning to the last great wooded frontier of the world: the Amazon basin of South America.

Feeding the rich

The food needs of the Western world have played equal havoc with the lands of the Third World. No statistics on this are available, but if someone did collect them, we will definitely find that despite the worldwide process of decolonisation, there is today many times more land being used in the developing world to meet the food and other biomass needs of the Western countries than in the 1940s, before the process of decolonisation began. More than a quarter of all central American forests have been destroyed since 1960 for cattle ranching : 85 percent to 95 percent of the beef produced as a result has gone to the US while domestic consumption of beef in central America has fallen dramatically. In the US, this beef has been mainly used to make tinned and pet foods and cheap hamburgers because central American beef is half the price of the grass-fed beef produced in the US. The price of central American beef does not represent its correct ecological cost. Cattle ranching has proved to be the worst form of land use for the fragile soils on which these tropical moist forests existed.

Within five to seven years, their productivity has dropped dramatically and cattle ranchers have had to move on. The Sahelian

drought of 1968-74 in Africa which grabbed world headlines and claimed the lives of approximately 100,00 nomadic people, was caused by the French colonial policy to drive the region's countries into peanut farming to secure its own source of vegetable oils. Through heavy taxation policies, the French colonial authorities forced west African peasants to grow groundnuts at the expense of subsistence crops. Groundnut cultivation rapidly depleted the soil. It soon spread to traditionally fallow and forest zones and encroached on land previously used for grazing, upsetting the delicate balance between the farmers and nomadic herders. The expansion of groundnuts was encouraged by artificially high prices but when US soya production began to hit the European market and vegetable oil prices began to fall, the newly independent west African countries had no alternative but to increase area under groundnut to keep up their foreign exchange reserves. As this area increased by leaps and bounds under the pressure of government policies, the nomads were slowly pushed further and further north into the desert, something for which they were not prepared, their traditional relationships with the settled farmers having been totally disturbed. When the long period of drought set in and thousands of animals and human beings began to die, the nomads and their overgrazing was blamed.

Nobody blamed the French or the Sahelian elite which worked hand-in-glove with the French. The UN Environment Programme (UNEP) in a recent report points to the impact of the heavy debt burden of the Third World and high interest rates in the West on the environment of the Third World. The debt burden and regressive terms of trade have forced many developing countries to put enormous pressure on their natural resources, sometimes even to the point of overexploitation.

In 1981, for instance, it took one Latin American country 9.8 times as much beef to buy a barrel of oil as it did in 1981. At the end of the 1970s, profits from the export of one tonne of bananas were enough to purchase only half the steel they would have bought at the end of the 1960s. When interest rates are high, there is a tendency to discount long-term issues like environment for short-term gains. A one per cent increase in interest rates adds approximately US $5 billion to the current debt burden of

developing countries. To have increased its export earnings (not profits) by $1 billion in 1981, South America as a whole would have had to increase its banana exports three-fold, Ecuador three-fold and Colombia ninefold, while leading cotton exporters like Egypt and Turkey would have had to double and triple their cotton exports respectively. This would have meant bringing millions of additional hectares into production to grow these export crops. And, it can be added, this would have pushed millions of marginal peasants into marginal lands like desert fringes and steep hill slopes for their survival, leading to accelerated desertification and soil erosion. In our own country, the first major attack on the forests of the northeast came with the establishment of tea plantations. Destruction of forests goes on for coffee and other export crop plantations even today. The current overfishing on India's coasts, as on the coasts of almost all Southeast Asian countries, is taking place because of the heavy demand for prawns in Western and Japanese markets.

This overfishing is leading to considerable tensions between traditional fisherfolk and trawler owners, and violent encounters between the two are regularly reported. Recently, Indonesia completely banned the operation of trawlers in its coastal waters and several countries, including India, have decreed regulations to prevent trawler operators from fishing in the first few kilometres from the coast.

This zone is reserved for traditional fisherfolk. But policing trawlers over such an extensive coastline is an expensive proposition and regulations are, therefore, seldom observed or enforced. The export of frog's legs to cater to the palates of Western consumers and its impact on the agricultural pest populations in affected areas is now an old story. Fortunately, India not being a major export-oriented country, there are not many such examples. But the pattern of environmental exploitation by industry that we see on the global scale simply reproduces itself on the national scale in India.

What Western industry does to the Third World environment, Indian industry does to the Indian environment. Just to get an idea of how heavily dependent modern industry is on the natural environment, it may be useful to point out that nearly half the

industrial output in India is accounted for by industries which can be called biomass-based: that is, industries like cotton textiles, rayon, paper, plywood, rubber, soap, sugar, tobacco, jute, chocolate, food processing and packaging, and so on. Each of these industries exerts an enormous pressure on the country's cultivated and forest lands. They need crop lands, they need forests, and they need energy and irrigation.

The Indian paper industry has ruthlessly destroyed the forests of India. Paper companies in Karnataka, having destroyed all the bamboo forests, are now getting their raw materials from the last major forested frontier of India: the northeast. The government's own public sector paper companies are coming up in the northeast itself. The Andhra Pradesh government has meanwhile set its sights on the forests of Andaman and Nicobar Islands for the paper mill that it wants to build in Kakinada. A leading soap manufacturer has proposed that the Great Nicobar Islands be denuded to plant palm oil.

The shortage of raw materials for wood pulp has already forced the government to liberalise import of pulp for the country's paper industry, thus adding to the pressure on the forests of other Third World countries. One lesson is, therefore, clear: the main cause of environmental destruction in the world is the demand for natural resources generated by the consumption of the rich (whether they are rich nations or rich individuals and groups within nations) and because of their gargantuan appetite, it is their wastes mainly that contribute to the global pollution load.

ENVIRONMENTAL VALUES BASED ON THE CONSTITUTION OF INDIA

- *Article 48A*: "The state shall endeavour to protect and improve the environment and to safeguard the forests and wildlife in the country."
- *Article 51A (g)*: The constitution expects that each citizen of the country must "protect and improve the natural environment, including forests, lakes, rivers and wildlife, and to have compassion for all living creatures."

While we do need economic development, our value system must change to one that makes people everywhere support a

sustainable form of development so that we do not have to bear the cost of environmental degradation. Environmental problems created by development are due neither to the need for economic development, nor to the technology that produces pollution, but rather to a lack of awareness of the consequences of unlimited and unrestrained anti-environmental behaviour.

Looked at in this way, it deals with concepts of what is appropriate behaviour in relation to our surroundings and to other species on Earth. How we live our lives in fact shapes our environment. This is what environmental values are about. Each action by an individual must be linked to its environmental consequences in his/her mind so that a value is created that leads to strengthening pro-environmental behaviour and preventing anti-environmental actions.

This cannot happen unless new educational processes are created that provide a meaning to what is taught at school and college level. Every small child while growing up asks questions like 'What does this mean?'. They want an explanation for things happening around them that can help them make decisions and through this process develop values. It is this innate curiosity that leads to a personalized set of values in later life. Providing appropriate 'meanings' for such questions related to our own environment brings in a set of values that most people in society begin to accept as a norm. Thus pro environmental actions begin to move from the domain of individuals to that of a community. At the community level, this occurs only when a critical number of people become environmentally conscious so that they constitute a proenvironment lobby force that makes governments and other people accept good environmental behaviour as an important part of development.

What professions require making value judgements that greatly influence our environment? Evidentally nearly every profession can and does influence our environment, but some do so more than others. Policy makers, administrators, landuse planners, media, architects, medical personnel, health care workers, agriculturalists, agricultural experts, irrigation planners, mining experts, foresters, forest planners, industrialists and, most importantly, teachers at school and college level, are all closely

related to pro environmental outcomes. Environmental values have linkages to varied enviro-nmental concerns. While we value resources that we use as food, water and other products, there are also environmental services that we must appreciate.

These include Nature's mechanisms in cleaning up air by removing carbon dioxide and adding oxygen by plant life, recycling water through the water cycle of nature, maintaining climate regimes, etc. But there are other aesthetic, ethical values that are equally important aspects of our environment that we do not appreciate consciously.

While every species is of importance in the web of life, there are some which man has come to admire for their beauty alone. The tiger's magnificence, the whale and elephant's giant size, the intelligence of our cousins the primates, the graceful flight of a flock of cranes, are parts of nature that we cannot help but admire.

The lush splendor of an evergreen forest, the great power of the ocean's waves, and the tranquility of the Himalayan mountains are things that each of us values even if we do not experience it ourselves. We value its being there on Earth for us. This is called its 'existance value'. The list of wondrous aspects of Nature's intricate connections is indeed awe-inspiring. This is also a part of our environment that we must value for its own sake. This is the oneness of Nature. We must equally look at our environment beyond the wild sphere. There is incredible beauty in some man-modified landscapes, the coloured patterns of farmland or the greens of a tea or coffee plantation in the hills.

Urban gardens and open space are also valuable and thus must be of prime concern to urban planners. These green spaces act as not only the lungs of a city, but also provide much needed psychological support. The mental peace and relaxation provided by such areas needs to be valued, although it is difficult to put a price tag on these values.

Nevertheless, these centers of peace and tranquility give urban dwellers an opportunity to balance their highly man-modified environments with the splash of green of a garden space. Environmental values must also stress on the importance of preserving ancient structures. The characteristic architecture, sculpture, artworks and crafts of ancient cultures is an invaluable

environmental asset. It tells us where we have come from, where we are now, and perhaps where we should go. Architectural heritage goes beyond preserving old buildings, to conserving whole traditional landscapes in rural areas and streetscapes in urban settings. Unless we learn to value these landscapes, they will disappear and our heritage will be lost.

As environmentally conscious individuals we need to develop a sense of values that are linked with a better and more sustainable way of life for all people. There are several positive as well as negative aspects of behaviour that are linked to our environment. The positive feelings that support environment include a value for Nature, cultures, heritage, and equity.

We also need to become more sensitive to aspects that have negative impacts on the environment. These include our attitude towards degradation of the environment, loss of species, pollution, poverty, corruption in environmental management, the rights of future generations and animal rights.

Several great philosophers have thoughts that have been based on, or embedded, in pro environmental behaviour.

Mahatma Gandhi and Rabindranath Tagore are among the many internationally well-known scholars whose thought have included values that are related to environmental consciousness. We need to appreciate these values to bring about a better way of life on earth for all people and all living creatures.

Valuing Nature

The most fundamental environmental sentiment is to value Nature herself. Appreciating Her magnificence and treasuring life itself leads to positive feelings that are a manifestation of pro environmental consciousness. The one-ness of our lives with the rest of nature and a feeling that we are only a miniscule part of nature's complex web of life becomes apparent, when we begin to appreciate the wonders of nature's diversity. We must appreciate that we belong to a global community that includes another 1.8 million known living forms.

Nothing makes us more conscious of this wonderous aspect of our earth's diversity than a walk through the wilderness, feeling and exploring its beauty and experiencing its infinite variety. The

tiny creatures that live complex lives and the towering trees are all a part of this phenomenon we call 'life'. Today, man does not even know if other complex forms of life exist outside our own solar system in distant space. We may be alone in space or may be accompanied by other, completely different, living forms. But for now we only know for sure that the Earth's life forms are unique.

We thus have a great responsibility to protect life in all its glorious forms and must therefore respect the wilderness with all its living creatures, where man's own hand has not created changes that have led to perturbing natural habitats. We need to develop a sense of values that lead us to protect what is left of the wilderness by creating effective National Parks and Wildlife Sanctuaries. However this cannot be done to the detriment of the millions of tribal or indigenous people who live in wilderness ecosystems. There are thus conflicting values that need to be balanced carefully. On the one hand we need to protect natural ecosystems, while on the other, we must protect the rights of local people. Yet apart from valuing the diversity of life itself, we must also learn to value and respect diverse human cultures. Many of the tribal cultures of our country are vanishing because those with more dominant and economically advanced ways of life do not respect their lifestyles, that are in fact closer to nature and frequently more sustainable. We believe that our modern technology-based lifestyles are the sole way for society to progress. Yet this is only a single dimension of life that is based on economic growth.

ENVIRONMENT AND HUMAN HEALTH

Environment related issues that affect our health have been one of the most important triggers that have led to creating an increasing awareness of the need for better environmental management. Changes in our environment induced by human activities in nearly every sphere of life have had an influence on the pattern of our health. The assumption that human progress is through economic growth is not necessarily true.

We expect urbanization and industrialization to bring in prosperity, but on the down side, it leads to diseases related to overcrowding and an inadequate quality of drinking water, resulting in an increase in waterborne diseases such as infective

diarrhoea and air borne bacterial diseases such as tuberculosis. High-density city traffic leads to an increase in respiratory diseases like asthma. Agricultural pesticides that enhanced food supplies during the green revolution have affected both the farm worker and all of us who consume the produce.

Modern medicine promised to solve many health problems, especially associated with infectious diseases through antibiotics, but bacteria found ways to develop resistant strains, frequently even changing their behaviour in the process, making it necessary to keep on creating newer antibiotics. Many drugs have been found to have serious side effects. At times the cure is as damaging as the disease process itself.

Thus development has created several long-term health problems. While better health care has led to longer life spans, coupled with a lowered infant mortality, it has also led to an unprecedented growth in our population which has negative implications on environmental quality. A better health status of society will bring about a better way of life only if it is coupled with stabilising population.

Environmental Health

Environmental health, as defined by WHO, comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social, and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that adversely affect the health of present and future generations. Our environment affects health in a variety of ways.

Climate and weather affect human health. Public health depends on sufficient amounts of good quality food, safe drinking water, and adequate shelter. Natural disasters such as storms, hurricanes, and floods still kill many people every year. Unprecedented rainfall trigger epidemics of malaria and water borne diseases. Global climate change has serious health implications. Many countries will have to adapt to uncertain climatic conditions due to global warming. As our climate is changing, we may no longer know what to expect.

There are increasing storms in some countries, drought in others, and a temperature rise throughout the world. The El Niño winds affect weather worldwide. The El Niño event of 1997/98 had serious impacts on health and well-being of millions of people in many countries. It created serious drought, floods, and triggered epidemics. New strategies must be evolved to reduce vulnerability to climate variability and changes.

Economic inequality and environmental changes are closely connected to each other. Poor countries are unable to meet required emission standards to slow down climate change. The depletion of ozone in the stratosphere (middle atmosphere) also has an important impact on global climate and in turn human health, increasing the amount of harmful ultraviolet radiation that reaches the Earth's surface. This results in diseases such as skin cancer.

Bhopal Gas Tragedy

The siting of industry and relatively poor regulatory controls leads to ill health in the urban centers. Accidents such as the Bhopal gas tragedy in 1984 where Union Carbide's plant accidentally released 30 tones of methyl isocyanate, used in the manufacture of pesticides, led to 3,330 deaths and 1.5 lakh injuries to people living in the area. Development strategies that do not incorporate ecological safeguards often lead to ill health. Industrial development without pollution control and traffic congestion affect the level of air pollution in many cities. On the other hand, development strategies that can promote health invariably also protect the environment. Thus environmental health and human health are closely interlinked. An improvement in health is central to sound environmental management. However this is rarely given sufficient importance in planning development strategies.

Examples of the Linkages

- Millions of children die every year due to diarrhoea from contaminated water or food. An estimated 2000 million people are affected by these diseases and more than 3 million children die each year from waterborne diseases across the world. In India, it is estimated that every fifth child under the age of 5 dies due to diarrhoea. This is a result of inadequate environmental management and is

mainly due to inadequate purification of drinking water. Wastewater and/or sewage entering water sources without being treated leads to continuous gastrointestinal diseases in the community and even sporadic large epidemics. Large numbers of people in tropical countries die of malaria every year and millions are infected. An inadequate environmental management of stagnant water, which forms breeding sites of Anopheles mosquitoes is the most important factor in the spread of malaria. The resurgence of malaria in India is leading to cerebral malaria that affects the brain and has a high mortality.

- Millions of people, mainly children, have poor health due to parasitic infections, such as amoebiasis and worms. This occurs from eating infected food, or using poor quality water for cooking food. It is estimated that 36% of children in low-income countries and 12% in middle income countries are malnourished. In India, about half the children under the age of four are malnourished and 30% of newborns are significantly underweight.
- Hundreds of millions of people suffer serious respiratory diseases, including lung cancer and tuberculosis, from crowded homes and public places. Motor vehicle exhaust fumes, industrial fumes, tobacco smoke and cooking food on improper 'chulas', contribute to respiratory diseases.
- Millions of people are exposed to hazardous chemicals in their workplace or homes that lead to ill health due to industrial products where controls are not adhered to.
- Tens of thousands of people in the world die due to traffic accidents due to inadequate management of traffic conditions. Poor management at the accident site, and inability to reach a hospital within an hour causes a large number of deaths, especially from head injuries.
- Basic environmental needs such as clean water, clean air and adequate nutrition which are all related to environmental goods and services do not reach over 1000 million people living in abject poverty.
- Several million people live in inadequate shelters or have

no roof over their heads especially in urban settings. This is related to high inequalities in the distribution of wealth and living space.

- Population growth and the way resources are being exploited and wasted, threatens environmental integrity and directly affects health of nearly every individual.
- Health is an outcome of the interactions between people and their environment. Better health can only come from a more sustainable management of the environment.

LIVING ON THE EDGE: WHY ON EARTH IN THE FLOOD PLAIN

Very few places on earth are not vulnerable to floods, except for the highest mountain tops and under present climate conditions, huge expanses of deserts such as the Gobi or the Sahara. The areal extent of flooding events is often vast and some places experience prolonged durations that result in a heavy toll. An example of a flood that brought large financial losses is the 1993 flood in the Midwestern US; disastrous losses of life are periodically seen in China and other Southeast Asian countries.

Flooding accounts for 40% of all natural disasters with more than one hundred deaths per event (Burton, Kates, and White 1993). This enormous toll is due to the extent and frequency of flooding, the fact that people live and work in areas prone to flooding, and inadequate warning of the approaching dangers. Given these facts, why do people continue to live in riverain and coastal areas bound to be flooded?

Floodplains are areas defined as most at risk from flooding, both riverain and coastal. The areal extent of the flood varies with the magnitude of storms, the rapidness of snowmelt, the height of the storm surge, and other geographic factors. Yet floodplains are also among the most attractive areas for human occupance; they are level, easy to build on, and they have very fertile soils. Coastal areas, in addition, offer access to, and sometimes a much desired view of, the ocean. In the United States, the federal government is most concerned with flooding in what is called the 100-year floodplain. The 100-year flood recurrence interval refers to a probability of at least 1% that an area will be flooded in any

given year. This corresponds to the flood levels expected on the long-term average of once every one hundred years, hence the often misinterpreted term "100-year flood" (USGS 1995). It is important to note that only the outermost edges of the 100-year floodplain have a risk as low as 1% per year (Platt 1996). As one moves closer to the stream channel or tide line, the risk increases progressively. This kind of recurrence terminology, unfortunately, has the effect of making the flood hazard sound remote and not worthy of attention by those at risk. People think that they will be gone or not using the area anymore by the time the next flood event is expected to occur. This misunderstanding is cause for great concern.

To the engineers and hydrologists who delineate the 100-year floodplain, flooding events are random, meaning that the probability of their recurrence is the same each year (1 in 100 or 1%). For those at risk, however, there has been a demonstrated tendency to assume that a severe hazard occurrence such as a 100-year flood is followed by a period of lessened hazard activity (Burton, Kates, and White 1993). This partly explains why activity in and occupance of hazardous areas increases. Experience with the flood hazard is frequency-dependent and as such, new arrivals to the hazardous area may be less accurate in their judgement of the flooding risk. This is especially important with respect to the prospects of global change; flood frequencies and magnitudes might increase both because of changes in climate and rising sea levels and because of increasing numbers of people moving into flood-prone areas, rapid urbanization, and poverty. The threat to life and property associated with flooding is expected to increase without intervention — that is, even if climate will not change in the future.

Appropriate intervention aimed at reducing disaster proneness must address population increases in the hazardous floodplain directly as well as upstream watershed management (e.g., farm management techniques to reduce filling up of stream channels with sediment) and the over-reliance on technology, structural protection measures, and insurance, all of which foster a false sense of safety behind levees and insurance policies. Living with nature, rather than over-engineering and conquering it, clearly calls for a new approach to floodplain management.

SOCIETIES RESPOND AND ADJUST TO ENVIRONMENTAL HAZARDS

Given the enormous complexity of nature-society-technology interactions and the rather bleak trends in both disaster occurrence and societal vulnerability to hazards that we have discussed so far, shouldn't we simply "throw in the towel" and let nature and societal developments take their course? To us as individuals, things often seem to be getting worse and worse, and we don't seem to be able to put the brakes on these global physical and social processes anyway.

It would be a sad outcome, indeed, if we ended this module on such a pessimistic, even fatalistic, note. Such an attitude would dismiss entirely the fact that throughout human history, societies the world over have shown great ingenuity in adapting to their environments. It would also overlook the reality that humans are active creators of, and collaborators in, their living circumstances. We have contributed to the hazardousness of our environments as well as to the many efforts at maintaining and increasing our safety: we have workplace safety standards; we have structural and non-structural tools to protect ourselves from floods; we continue to improve our ability to forecast and warn of approaching hazards like tropical storms, earthquakes, and volcanic eruptions; we have emergency response institutions; we have public and private insurance; and the idea of preventing environmental harm (the precautionary principle) is becoming increasingly widespread as the yet-unknown impacts of global climate change loom on future's horizon.

Clearly, we have a long way to go if we want to reverse current disaster and vulnerability trends. In particular, we will have to spread our successes in mitigation much more evenly within and among nations. Some people hope that the IDNDR, along with the threat of global change, may actually translate into a strong momentum to improve disaster mitigation. Using that stimulation ourselves, we focus in this last unit on the basic question of what can be done to respond to and mitigate hazards, global environmental and societal changes notwithstanding. We begin in the first section with a look at the different phases of responding and adjusting to hazard events.

The next three sections then discuss in greater detail the three fundamental ways of reducing the impacts from disasters — modifying the hazard, reducing human vulnerability to them, and sharing the losses. Just as people perceive and experience hazards differently, we must also discriminate among people in their ability to adjust to hazards. In the final section, we will see again that in this complex interplay of humans and their natural environment there are no simple answers to the question of how best to respond to hazards and lessen their impacts.

Societal Response and Adjustments

The study of societal responses to hazards ranges from *what* people do in the immediate aftermath of an event and in the long term, to *how*, *when*, and *why* they respond. Response can also be more narrowly defined to mean just the immediate action after a disaster. The following discussions are primarily about the "what and when," focussing on emergency response and long-term mitigation. Interesting work at the hazards/global change interface on societal learning, delayed and foregone responses, and responses to creeping/chronic hazards is not discussed here but ultimately contributes to a fuller understanding of effective societal adjustments to hazards.

When a disaster strikes, the immediate societal adjustments are to rescue the survivors and re-establish the lifelines (water, electricity, sewage, communication) to the ravaged community. These relief operations include medical supplies, food, shelter, water, and power. Often, such emergency response and relief operations are within the capabilities of the affected country. In some instances, however, the disaster is too large for the individual country and international relief efforts are mobilized by relief organizations such as the Red Cross/Red Crescent and through cooperative arrangements within the United Nations (U.N. Disaster Relief Organization or UNDRO).

Once the lifelines are re-established and the crisis period is over, the recovery phase begins. Recovery adjustments (like sheltering, clean-up, repairs, treating injuries, assuring order and safety from criminal behaviour during emergency situations) are temporary in nature and provide for a return to normalcy after an event. The use of temporary shelters during the recovery period

gives way to building permanent structures during the reconstruction phase. Throughout the recovery and reconstruction phases, hazard mitigation continues.

Mitigation is a general term used to describe a wide range of methods for disaster loss reduction that goes on before, during, and after a disaster. Some mitigation options are structural, meaning they affect the material construction or organization of something (e.g., the use of steel-reinforced construction materials in seismic areas or the use of elevated pilings in flood-prone areas). Other mitigation strategies are non-structural and involve land use planning and management, insurance, and pre-event preparedness (the establishment or reinstallation of warning systems).

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Border Disputes

BACKGROUND OF BORDER DISPUTE

India and Bangladesh have very close socio-cultural, linguistic and racial affinities, which evolved from a common historical legacy and geographical proximity. Bengal province was divided between India and Pakistan in 1947 and the boundary did not follow natural barriers; meandering through villages, agricultural lands, and rivers, rendering the border porous with many disputed pockets. The terms of reference for Radcliffe, while demarcating the boundaries of two parts of Bengal was, 'to demarcate the boundaries of the two major parts of the Bengal on the basis of ascertaining the contiguous majority areas of Muslims and non-Muslims while taking into account other factors'. The commission followed the river system and the concept of the hinterland, while demarcating the territory. As a result, on the Pakistani side, there were non-Muslim majority areas for two-fifth of its length. On the Indian side, Muslim majority areas were made up of one-fifth of its length. Only 15 percent of the border did not cut through either Muslim or Hindu majority area

Shortly after the Radcliffe award, Nehru-Noon Agreement was signed in New Delhi on 10 September 1958. This was followed by series of other agreements. The disputes did not settle. In 1974, India and Bangladesh started Land Boundary Agreement (LBA)-1974, which laid down the methodology for demarcating various

disputed stretches in the border land. Among all the outstanding boundary issues, enclaves and adversely possessed land (APL) are capable of undermining the relationship most. The contents of the Land Boundary Agreement of 1974 and its shortcomings are given in succeeding paragraphs of chapter IV of this research.

Complexities of Enclave/ Exclaves Land system and Land Under Adverse Possession. An enclave is a land within or bounded by other territories. When an enclave belongs to another sovereign country, it is called an exclave of that country. Here, these are also referred to as 'Chit Mohols'. There are 111 Indian enclaves measuring 17158.13 acres of land in Bangladesh and 51 Bangladeshi enclaves covering 7110.2 acres of land in India. While the Indian enclaves in Bangladesh are spread over four districts (Panchagarh, Lalmonirhat, Kurigram and Nilphamari), all the Bangladeshi enclaves inside India are in the Cooch Behar district of WB. The enclaves trace their origin to the chess game played between the Rajas of Cooch Behar and Rangpur during the 18th century, in which parts of their territories were offered as stakes. The present enclaves are actually those territories, which were won or lost by either party. The two rulers wrote the names of the villages on a small piece of paper (or chit) and exchanged them whenever they won or lost a game. That is why these enclaves are called "chit mahals" or "paper palaces." The enclaves pose a grave security risk to the respective countries. These enclaves have become hubs for criminals and terrorists. Besides, the quality of life inside enclave is simply horrendous, as the residents are deprived of socio-cultural, political and economic rights that any average citizen of a country enjoys. Most of these enclaves do not have basic amenities like schools, hospitals, clean drinking water, electricity, roads, etc. Residents of these enclaves are not issued with passports or visas and are denied transit facilities. Lack of legitimate means of livelihood, has forced many to engage in smuggling and other illegal activities. In addition to these enclaves, there are 38 patches of Indian land, measuring about 3024.16 acres and 50 patches of Bangladeshi land, measuring 3506.31 acres, which are in adverse possession of both the countries. These are created due to the following reasons:-

(a) The people of respective countries living there since 1947.
(b) By the change of river's courses along the border.

(c) Non-availability or missing border pillars.
(d) Refusal of any one nation to sign the strip maps.
(e) Due to the exchange of vested property.
(f) Migrated landlords who refused to sell their properties in 1947.

Land Boundary Act – 1974. Owing to any one of the above reasons, these adverse possessions have the potential to create serious friction between the two countries as was seen earlier in 2001 at Roumari, Kurigram. To resolve the outstanding boundary issues, Land Boundary Act was signed in 1974, which provided for the 'expeditious exchange' of enclaves and 'surrender' of adverse possessions.

Forming of Joint Boundary Working Group (JBWG I and II). Un-demarcated stretches, enclaves, and adverse possessions along the Indo- Bangladesh border, had been causing constant friction between the two countries. Although a tacit understanding regarding the existence of de-facto boundary exists along these adverse possessions and undemarcated stretches, tensions do flare up occasionally. India and Bangladesh established Joint Boundary Working Group (JBWG) I & II in 2001, in order to discuss the issue of un-demarcated areas and enclaves and adverse possessions, respectively. These groups met four times over ten years and came up with a mechanism to resolve the dispute, culminating in the 'Protocol to the Agreement concerning the Demarcation of Land Boundary between India and Bangladesh' on 06 September, 2011.

Illegal Migration

Before discussing illegal migration, it would be prudent to define refugees and migrants:-

(a) Refugee. Refugees are those, who are forced to give up their homeland/ nation and cannot return to their home nation for fear of political, religious or social persecution.
(b) Migrant. A migrant is a person who moves voluntarily, out of choice, to settle elsewhere for a better life, to leave conditions of deprivation or environmental/economic pressure at home. There can be internal of external migrants.

When these migrants enter a foreign country without permission or stay beyond the date of termination of a visa, they

become illegal migrants. India has long been claiming widespread population influx from Bangladesh. As per reports, from 1971-2001 an approximately 12 million Bangladeshis have illegally migrated into various states of NE India. Various "push" factors such as political upheavals, religious persecution, demographic pressures, and environmental crises; and "pull" factors such as availability of land, employment opportunities, medical care, and education have contributed to the large influx of Bangladeshis into India. This phenomenon has generated a host of destabilising political, social, economic, ethnic and communal tensions in many states (as seen in Assam recently) in India. The illegal immigrants have in turn become important determinants of local vote bank politics in India, as the immigrants have managed to acquire ration cards through unscrupulous politicians in WB and Assam India is very concerned with this influx of Bangladeshi migrants and similarly Bangladesh continues to deny any large-scale migration. A large number of migrants are also possibly using India as a transit country. A large part of the movement across the border is trafficked women and children, which is a source of concern for both the nations. At the same time, some number of Indians are also crossing over to Bangladesh for various purposes like smuggling and illegal trafficking of women etc. As the fact stands, that being a larger and progressive economy, India offers better job opportunity and better living standards.

India continues to view illegal immigration very seriously, as it has transformed the demographic profile of their border population, leading to social tensions as was seen in the months of October – November 2012.

Trans-Border Crimes

The porosity of the border, lack of economic opportunities, poverty and under development, negligence in vigilance are some of the major reasons which contribute to the escalating trans-border crimes. Smuggling of cattle, arms, and other essential items, human and narcotics trafficking, counterfeit currency, kidnapping, and thefts are quite rampant along the India-Bangladesh border. Similarly, there is a high demand for Indian made pistols and rifles.

Cattle smuggling is another major issue. Cattle smuggling has enabled a flourishing leather industry in Bangladesh. In an average 80% of the people located within a km of international boundary (IB) are directly or indirectly involved in cattle trade. Apart from the cattle smuggling, Indo-Bangladesh border is being frequently used for smuggling of sugar, salt, medicine and so on.

BSF Killing of Illegal Trespassers and Migrants

The issues of trans-border crime and illegal migration usually terminate in BSF shooting or skirmishes between the border guarding forces on both the sides. Firing by the BSF on the miscreants has ultimately derailed the bilateral relationship and makes the border more vulnerable. There are incidents when even Indians have been killed by BSF shooting. The two sides signed a border management accord in July 2011. The BSF, in order to reduce the number of fatal casualties has resorted to use of non lethal weapons. Steps should be taken to restrict the movement of people along the border, especially during night hours, because "this policy of restraint has emboldened criminal elements who have stepped up their attacks on BSF personnel to facilitate their illegal activities. A number of attacks on BSF personnel and posts have recorded in year 2011 -12. Besides, these killings have financial implications also.

Border Incidents, Fencing and Most Recent Initiatives

Though the number of skirmishes between the security forces has reduced drastically, tension occasionally flares up. At the ground level, BSF shooting on illegal trespassers, construction of barbed-wire fence, permanent structures near the IB, etc are the main disputed issues between the two border guarding forces. To obviate minor friction between the security forces and guard against undesirable trans-border activities, 'Joint India-Bangladesh Guidelines for Border Authorities-1975' came into existence.

Interpretation of the 'Border Guideline-1975' has been a contentious issue between the two countries. Article 8(e) of this guideline suggests not having any permanent structures within 150 yards on either side. In order to prevent illegal migration, cross-border crime and smuggling, India started raising fence in

1987 along the border in two phases. However, due to difficulty in cultivating Indian land beyond the fence, local people have been strongly protesting against the fence construction. Even the Indian state governments were less interested in the fencing process, since illegal migrants from Bangladesh are perceived as vote banks.

FACTOR IN BORDER DISPUTE

This is perhaps the most militarized Buddhist enclave in the world. Perched above 10,000 feet in the icy reaches of the eastern Himalayas, the town of Tawang is not only home to one of Tibetan Buddhism's most sacred monasteries but also the site of a massive Indian military buildup. Convoys of army trucks haul howitzers along rutted mountain roads. Soldiers drill in muddy fields. Military bases appear every half-mile in the countryside, with watchtowers rising behind concertina wire.

A road sign on the northern edge of town helps explain the reason for all the fear and the fury: The border with China is just 23 miles away; Lhasa, the Tibetan capital, 316 miles; and Beijing 2,676 miles. "The Chinese army has a big deployment at the border, at Bumla," said Madan Singh, a junior commissioned officer who sat with a half-dozen soldiers one afternoon sipping tea beside a fog-cloaked road. "That's why we're here." Though little known to the outside world, Tawang is a flashpoint in relations between the world's two most populous nations. It is the focus of China's most delicate land-border dispute, a conflict rooted in Chinese claims of sovereignty over all of historical Tibet.

In recent months, both countries have stepped up efforts to secure their rights over this rugged patch of land. China tried to block a $2.9 billion loan to India from the Asian Development Bank on the grounds that part of the loan was slated for water projects in Arunachal Pradesh, the state that includes Tawang. It was the first time China had sought to influence the territorial dispute through a multilateral institution. Then an Indian general announced that the Indian military was deploying extra troops and fighter jets in the area. The growing belligerence has soured relations between the two Asian giants and has prompted one Indian military leader to declare that China has replaced Pakistan as India's biggest threat.

Economic progress might be expected to bring the countries closer. China and India did $52 billion of trade last year, a 34 percent increase over 2007. But businesspeople say that border tensions have infused official deliberations over business deals, dampening the willingness of Chinese and Indian companies to invest in each other's countries. "Officials start taking more time, scrutinizing things more carefully, and all that means more delays and ultimately more denials," said Ravi Bhoothalingam, a former president of the Oberoi Group, the luxury hotel chain, and a member of the Institute of Chinese Studies in New Delhi. "That's not good for business."

The roots of the conflict go back to China's territorial claims to Tibet. Not only does the Dalai Lama, the exiled spiritual leader of the Tibetans, live in the foothills of the western Himalayas with the blessing of the Indian government, but China insists that this swath of northeast India has historically been part of Tibet, and thus should be part of China. Tawang is a thickly forested area of white stupas and steep, terraced hillsides that is home to the ethnic Monpa people, who practice Tibetan Buddhism, speak a language similar to Tibetan and once paid tribute to rulers in Lhasa. The 6th Dalai Lama was born here in the 17th century.

The Chinese army occupied Tawang briefly in 1962, during a war with India fought over this and other territories along the 2,521-mile border. More than 3,100 Indian soldiers and 700 Chinese soldiers were killed and thousands wounded in the border war. War memorials highlighting China's aggressions in Tawang here are big draws for Indian tourists. "The entire border is disputed," said Ma Jiali, an India scholar at the China Institutes of Contemporary International Relations, a government-supported think tank in Beijing. "This problem hasn't been solved, and it's a huge barrier to China-India relations."

In some ways, Tawang has become a proxy battleground, too, between China and the Dalai Lama, who passed through this valley when he fled into exile in 1959. From his home in the distant hill town of Dharamsala, he wields enormous influence over Tawang. He appoints the abbot of the powerful monastery and gives financial support to institutions throughout the area. Last year, the Dalai Lama announced for the first time that Tawang is

a part of India, bolstering the Indian government's territorial claims and infuriating China.

Traditional Tibetan culture runs strong in Tawang. At the Tawang monastery, an important centre of Tibetan learning, monks express apprehension about China's rule over Tibet, which the Chinese army seized in 1951. "I hate the Chinese government," said Gombu Tsering, 70, a senior monk who watches over the monastery's museum. "Tibet wasn't even a part of China. Lhasa wasn't a part of China." Few expect China to try to forcefully annex Tawang, but military skirmishes are a real danger, analysts say. The Indian military recorded 270 border violations and nearly 2,300 instances of "aggressive border patrolling" by Chinese soldiers last year, said Brahma Chellaney, a professor of strategic studies at the Centre for Policy Research, a research organization in New Delhi. Mr. Chellaney has advised the Indian government's National Security Council.

"The India-China frontier has become more 'hot' than the India-Pakistan border," he said in an e-mail. China has grown increasingly hostile to the Dalai Lama after a severe outbreak of ethnic unrest in Tibet. This year, it turned its diplomatic guns on India. China moved in March to block a $2.9 billion loan to India from the Asian Development Bank, a multi-nation group based in Manila that has China on its board, because $60 million of the loan had been earmarked for flood-control projects in Arunachal Pradesh, the state that includes Tawang. The loan was approved in mid-June over China's heated objections. Weeks after China first tried to block the loan, the chief of the Indian air force, now retired, told a prominent Indian newspaper that China posed a greater threat than Pakistan. Another official, J.J. Singh, the governor of Arunachal Pradesh and retired chief of the Indian army, said the next month that the Indian military was adding two divisions of troops, totalling 50,000 to 60,000 soldiers, to the border region over the next several years. Four Sukhoi fighter jets were immediately deployed to a nearby air base. Since 2005, when Chinese Prime Minister Wen Jiabao visited India, the two countries have gone through 13 rounds of bilateral negotiations over the issue. A last round was just held last month, with no results. Though China has actually resolved many of its border disputes in recent years, India remains a glaring exception.

The Government of Tibet in Exile

From July 20 to 23, 1994, Beijing staged the Third Forum on Work in Tibet which recommended the total destruction of an entire civilization flourishing on the Tibetan Plateau for thousands of years. This cultural "empire" once encompassed far-flung areas like Buryatia, Tuva and Kalmykia in Russia; Mongolia; Laddakh, Lahaul-Spiti, Sikkim, and Arunachal Pradesh in India; Mustang, Dolpo and Solo Khumbu in Nepal; Bhutan and parts of western China.

The policy formulated in 1994 in Beijing-and these days pursued with Cultural Revolutionary zeal in Tibet-will mean the annihilation of the spiritual homeland of this shared culture. Implementation of the Third Work Forum is thus having a crippling impact on the traditional culture of millions of non-Tibetans as the well-spring of their cultural inspiration is forcibly drained and there is nothing to replenish the continuous growth and development of this distinct and highly evolved civilization.

Losing Hearts and Minds

The decisions made at the Third Forum rest on two fundamental conclusions which Beijing drew. It realized it was losing out in two vital fields-ideology and propaganda. For a state whose existence is justified by its ideological superiority and the power of its propaganda to shape the thinking of the masses, the implications of this for the future was at best uncertain, at worst dangerous. Beijing concluded it was losing the ideological war because, despite the unrelenting assault on Tibetan Buddhism, Tibetans were as devoted to their traditional beliefs as ever. Beijing has succeeded in physically enslaving the country but it has not won over the hearts, minds and loyalty of the Tibetan populace.

Communist ideology, enforced by the military might of China, had failed to dent the heart of Buddhism. Added to this was the communist authorities' total bafflement at the non-violent policy underpinning the Middle Way Approach advocated by His Holiness the Dalai Lama to resolve the issue of Tibet's future status. For a regime which is based on Mao's dictum that political power grows out of the barrel of a gun, this supposedly eccentric philosophy which says victory lies in capturing the hearts and

minds of people by the power of ideas rather than killing by the power of the gun comes as a bolt from the blue. Much of Beijing's knee-jerk reaction to, and its bafflement at, His Holiness the Dalai Lama's new policy of rapprochement lies at the heart of its new hardline policy.

Beijing considered it was losing the propaganda war because, for one reason or the other, the world's media and its pop culture considered-at least for the moment-Tibet and Tibetan Buddhism their very own cuddly pandas. Despite its financial might China found it extremely difficult to exterminate this image of Tibet and get its voice heard on the Tibetan issue in the court of the international media. In order to address these weaknesses the Third Forum concentrated on two issues. One was to focus on Tibet's economic development in the hope that this would keep Tibetan demonstrations off the streets. This was tantamount to bribing the Tibetans with promises of riches to come if they toed the party line. The other concern was to win the coming and new generations of Tibetans over to the Chinese viewpoint.

Beijing has given up on the present generation of Tibetans as a lost cause. If the coming generations of Tibetans were also lost to the 'Dalai Clique' this, the Chinese concluded, would have dangerous consequences for Chinese rule in Tibet. The 15-year-old Gyalwa Karmapa's dramatic escape from Tibet in January 2000 was a warning to the Beijing authorities of the erosion of loyalty to China. The Karmapa's flight, and the earlier escape of Agya Rinpoche, the abbot of Kumbum Monastery, came as a huge embarrassment for China, because retaining these high lamas gave China a degree of legitimacy for its rule in Tibet. This is the reason why Beijing is enforcing with greater strictness its 1993 instruction of recalling young Tibetans studying in schools and monasteries run by Dharmasala in India. This is also the rationale for Beijing closing down schools in Tibet which are privately run by Tibetans.

For these reasons Tibet today is in the throes of a second Cultural Revolution as the Chinese authorities step up their long-term strategy to exterminate Tibet's distinct cultural and ethnic identity. The authorities are pursuing a four-pronged strategy to achieve their final objective. They have stepped up repression

while employing their huge propaganda machine to paint a rosy picture of Tibet. They have quickened the pace of economic development to dampen Tibetan nationalism and are simultaneously moving more Chinese settlers onto the Tibetan Plateau to change Tibet's demographic composition and to ease social unrest because of mounting unemployment back in China.

The Third Work Forum on Tibet was convened by the top Chinese leadership and was presided over by President Jiang Zemin. The authorities have now enshrined this Work Forum as the most "important strategic policy to rejuvenate Tibet" and have hailed its directives as the new manifesto for party work on the plateau. The significance of the Third Work Forum lies in the fact that it overturned the more liberal policies laid out for Tibet's "development" by the First and Second Work Forums held in 1980 and 1984. The first two work forums were initiated by the late Hu Yaobang, then Secretary General of the Chinese Communist Party.

This liberal and somewhat maverick leader is credited with masterminding a series of measures to improve the social, economic and political conditions in Tibet. The brief spell of liberalization markedly improved the living conditions of the majority of Tibetans and contributed to a more relaxed intellectual and social climate.

The Third Work Forum reversed these policies and reinstated hardline measures under which Tibet is still reeling today. The Tibetans in Tibet perceive the current repressive policies as a second Cultural Revolution. The question is why did China choose to jettison its earlier more liberal policies and adopt a manifesto which is leading to the systematic destruction of Tibet's distinct culture. The answer lies in domestic and international events which forced China to formulate a series of hardline policies on Tibet which eventually crystallized into the Third Work Forum for Tibet. The world which confronted China in the late 1980s and early 1990s was a frightening one.

Starting from 1987, Tibet was rocked by a string of protest demonstrations, which called for Tibetan independence. One of the largest demonstrations which erupted on March 5, 1989 in Lhasa, forced the authorities to impose martial law on the city. These demonstrations are now seen to have been an inspiration behind the outburst of Chinese students' pro-democracy uprisings.

The authorities saw the series of Tiananmen Square demonstrations as a sign of their Central Government losing control, and in an attempt to regain supremacy, the authorities slaughtered-perhaps hundreds if not thousands of students on June 4, 1989. These demonstrations were a chilling replay to the authorities of the May 4, 1919 student demonstrations in Beijing which signalled a political and cultural awakening across the erstwhile Middle Kingdom.

Bejing's fears of losing control were exacerbated by external events which saw the unraveling of the communist world. The Solidarity Movement in Poland, the fall of the Berlin Wall, and the implosion of the Soviet Union fed Beijing's paranoia over threats to the Chinese Communist Party hold on power. Official China's fears were further inflamed by the rapidly changing attitude of the broad masses as they turned back from communism to traditional beliefs like Confucionism, Buddhism, Islam, Christianity and indigenous folk cults.

In the eyes of ordinary citizens communism was becoming totally discredited and this, more than anything else, was the biggest nightmare for China's leadership. The leadership's justification for staying in power was being disavowed by the masses. For a one-party dictatorship this historically indicates the first step along the slippery road to dissolution and removal of power.

For these reasons the Chinese leadership then reverted to its earlier view that traditional beliefs were its real enemy. In competing with Buddhism, Confucionism, Islam, Christianity and other isms, communism was losing out in terms of its ability to retain the loyalty and allegiance of the masses. The leadership revived the old aphorisms once served up to the Tibetan people to justify their policies to destroy Tibetan Buddhism during the Cultural Revolution. Bewildered Tibetans were then told that just as there cannot be two suns in the sky, so there cannot be both Buddhism and socialism in Tibet. Inevitably Buddhism then had to give way to socialism. And again, today, religion is being blatantly sublimated to Chinese state power.

These were the fears of the Chinese leaders when they met in Beijing in 1994 to hammer out their new Tibet initiatives. For the Chinese authorities Tibet is an especially sensitive issue because

of their conviction that hostile Western forces are using the issue of Tibet to "westernize" China and to lead to its territorial fragmentation.

The third generation Chinese leaders came to the conclusion that stability in Tibet was vital to the stability of China as a whole. Earlier, Tibet was merely of peripheral concern to the vital interests of China's sprawling communist empire. Now, with the Third Work Forum, the authorities were saying, "We must clearly understand that we must do our work in Tibet not only for the sake our of own region's stability and development, not only for the interests of our people, but also for the sake of the whole nation's stability and development."

In Tibet, China faced peculiar problems because of the inherent strength of Tibetan Buddhism and the depth of devotion of the populace to His Holiness the Dalai Lama. The sustained burst of religious revival that followed in the wake of the brief spell of liberalization in Tibet confirmed the leadership's worst fears that decades of concerted assault on Tibetan culture and religion had not extinguished the people's traditional beliefs and values. From merely nuisance value, the Chinese leadership now viewed Tibetan Buddhism as a very real and imminent threat to the stability of Chinese rule in Tibet. At the same time the Chinese leadership's attitude towards His Holiness the Dalai Lama changed. From being an uncertain ally in the peace process in Tibet, the current Chinese leadership now saw him as a full-blown "enemy". A top-level conclave held in Beijing on March 10, 1993 concluded that, "There are different factions within the Dalai Clique; they are, however, unanimous in their political nature and position. They differ from each other in ideological viewpoints and ways of expressing them. Different strategies must be adopted to use their differences, to deal with them differently in order to divide and destroy them."

Repeated statements by high-level officials describe the struggle against "splittism", the official term for Tibetan independence, as a "life-and-death struggle". At the 1994 annual meeting of the "TAR" Communist Party Committee to brief members on the policy thrust of the Third Work Forum on Tibet, Raidi, deputy Secretary of the Committee said, "Up to now, his (the Dalai Lama's)

standpoint on Tibet's independence has never changed, and we must reveal his double-faced true colour. The focal point in our region in the struggle against splittism is to oppose the Dalai Clique. As the saying goes, to kill a serpent, one must first cut off its head."

In short, the Third Work Forum decided that Beijing was in a position to solve the Tibet issue without the Dalai Lama's involvement. It abandoned the earlier liberal policy of including His Holiness the Dalai Lama in any future settlement of Tibet's status. His Holiness the Dalai Lama was clearly singled out as the cause of China's "Tibet problem". The Third Work Forum also abandoned the policy of granting concessions to Tibet because of the plateau's "special characteristics". This policy had been the cornerstone of recommendations made by the First and Second Tibet Work Forums.

To carry out its new hardline policies in Tibet, Beijing appointed Chen Kuiyuan as the "TAR" Party Secretary in 1992. Chen Kuiyuan's appointment is significant because he had a track record for being a tough and ruthless administrator. He had already served as the First Secretary of the Chinese Communist Party in Inner Mongolia and is credited with repressing the rebellious Mongols, many of whom refer to him as "the butcher". Chen Kuiyuan was especially recommended to the post by Hu Jintao, the current Vice-President of China, who was then the First Secretary of the Chinese Communist Party in Tibet.

Tackling Tibetan Nationalism

The Third Work Forum policies chalked out for Tibet contained four key elements. China stepped up the scale of repression in Tibet. External propaganda work was escalated. The pace of economic development in Tibet-and its corollary of encouraging more Chinese settlers and businessmen to take advantage of the economic boom on the "roof of the world"-was also increased. In short, Beijing had decided to tackle Tibetan nationalism head-on and observers are still assessing the consequences on both Chinese rule in Tibet and on the populace.

Beijing remains convinced that these key components of its current policy will stabilize Chinese rule over Tibet and solve once and for all, the vexed problem of its negative image over the way

Tibet has been handled. One main target of the current policy of repression is Tibetan Buddhism. Chinese leaders are increasingly alarmed by the proliferation of monasteries and temples which the period of liberalization spawned throughout Tibet: they are seen as the bastions of Tibetan nationalism. The authorities have set up "Democratic Management Committees" to control monasteries and nunneries and created "Work Inspection Teams" to supervise the "education" of monks and nuns.

A major thrust is underway to break the bond of loyalty between the clergy in Tibet and His Holiness the Dalai Lama in India. Campaigns like "Strike Hard" and "Patriotic Re-education", unleashed in 1996, are aimed at crippling the rise of Tibetan Buddhism which the authorities suspect is weaning the loyalty of the Tibetan people away from the communist party and towards His Holiness the Dalai Lama. One salient feature of the "Strike Hard" campaign is how differently it is interpreted in China and Tibet. China's "Strike Hard" campaign was started to weed out corruption. Tibet's version is used as a political tool to eliminate those whom the authorities label "splittists". In Tibet, rather than striking at corruption, the authorities turn a blind eye to this social disease in the hope that it will erode the traditional morality of Tibetans and undermine Tibetan Buddhism.

In fact, at a secret meeting held in December 1999 in Chengdu, capital of Sichuan province, Chen Kuiyuan, the hardline Party Secretary of "TAR" recommended to the Central Chinese Government that an all-out effort must be made to eradicate Tibetan Buddhism and culture from the face of the earth so that no memory of them will be left in the minds of coming generations of Tibetans-except as museum pieces.

Chen Kuiyuan stated that the main cause of instability is the existence of the Dalai Lama and his Government-in-Exile in Dharamsala and these must be "uprooted". He recommended that Tibet, Tibetan people and Tibetan Buddhism-in other words the very name of Tibet-must be destroyed and the "Tibet Autonomous Region" be merged with provinces like Sichuan. While treating Tibetans to boot-heel subjugation at home, internationally China was on an overdrive propaganda blitz. At a brainstorming conclave held on March 10, 1993, Zeng Jian-hui, Vice-Minister of the

Propaganda Ministry, told participants, "The propaganda work on the question of Tibet is one of the focal points of the entire external propaganda work...With regard to attacks by the West and the Dalai Clique and their frequent activities, our external propaganda should launch offensive. We should expand our spheres of influence; in particular, we should infiltrate our propaganda into the mainstream life of the West.

"Firstly we should continue to send Tibetan scholars and Tibetan singing and dancing troupes abroad to lecture and perform. Secondly, relevant embassies and consulates should aim at the public opinion and the activities of the Dalai Clique in the countries where they are stationed and utilize speeches, picture exhibitions, special articles and other forms to carry out propaganda work, so as to win over officials and people of those countries... We should reinforce the work of utilizing the power of foreign propaganda. A few years ago, in the light of the situation of that time, we made arrangements for foreign journalists to visit Tibet."

The September 3, 2000 edition of *People's Daily* carried a story headlined "Tibet Welcomes Foreign Journalists for Objective Reporting". It stated that "A senior Tibetan official said Sunday that Tibet welcomes foreign journalists to come for objective and just reporting, but not those who take distorted views. Raidi, Deputy Secretary of the Tibet Autonomous Regional Committee of the Communist Party of China and Chairman of the Standing Committee of the Tibetan Autonomous Regional People's Congress, made the remarks at a meeting here with a press delegation of Thailand."

In this context, it is interesting to note that N. Ram, the editor of India's *Frontline* magazine, devoted 36 pages of the September 15, 2000 issue to promote the Chinese line and recommended that the Indian Government expel the Central Tibetan Administration from Indian soil for being the main stumbling block to normal relations between India and China. It is difficult to assess to what extent the views contained in his stupendous reporting marathon are his own.

These editorial outbursts are in line with policy decisions outlined in the early nineties. During a two-day secret conclave in March 1993 in Chengdu, Vice-Minister Zeng Jian-hui, told

participants, "All foreigners that we entertain and send to Tibet must have a relatively objective opinion of Tibet. We should use people from abroad to carry out the propaganda on Tibet for us, which is more powerful than if we do it."

Along with its external public relations strategy, China is presently carrying out a potentially much more dangerous policy of speeding up the pace of Tibet's economic development and its related drive to bring more Chinese settlers onto the Tibetan Plateau.

Beijing's Western China Development Programme, which incorporates Tibet in its ambit, is devised to shift the focus of China's economic activities from Coastal China to the interior-both to narrow the imbalance in the level of economic development between the two regions and to ease population pressure on the coastal areas which attract millions of migrant workers.

The focus of Beijing's Western China Economic Development Programme in Tibet is to exploit the plateau's still untapped minerals and other natural resources and to upgrade Tibet's infrastructure-like roads and telecommunications-to facilitate transportation of these resources to China. The other purpose of the heightened level of economic activity is to divert the Tibetans' attention from their political fate to focus on their livelihood-thus undermining Tibetan nationalism.

The Chinese authorities aim to manipulate the situation in Tibet still further by bringing in more Chinese settlers who would then demographically cement Chinese rule once and for all. These current hardline policies and their implementation in Tibet are impacting the stalled Sino-Tibetan Dialogue and will vitally affect the ability of Tibetans to survive as a distinct people and culture.

Beijing's Flawed Perceptions

The basic flaws in China's new policy in its search to resolve the problem of Tibet is thinking the solution can exclude the involvement of His Holiness the Dalai Lama. The other is in attempting to solve the problem over the heads of Tibet's citizens.

These two fundamental mistakes will exacerbate China's Tibet problem, not solve it. The reason lies in the history of Tibet and in the sentiments of the people. The institution of the Dalai Lamas

of Tibet is more than 600 years old, if we start from the birth of the first Dalai Lama in 1391.

In the course of its growth and development, the very institution itself came to symbolize fundamental beliefs and the political destiny of the nation. The bond between the Dalai Lamas and the Tibetan people is fundamental and unbreakable; any attempt, however sustained, will never succeed in driving a wedge between the two.

Consequently, China's current policy of forcing Tibetans-especially monks and nuns-to denounce His Holiness the Dalai Lama and pledge loyalty to the Chinese Communist Party will prove counterproductive.

In view of this the Third Work Forum's basic assumption that in the case of Tibet time is on the side of China, and that Beijing can stall the problem of Tibet till the demise of the present Dalai Lama whereupon the issue of Tibet will solve itself, is fatally flawed-based as it is on a mistaken perception of the role played by the institution of the Dalai Lamas in the development of Tibetan history.

This assumption, if not reviewed, revised and abandoned, will prove catastrophic for the Chinese leadership and for those who chose to turn their whimsical personal analysis into state policy.

The reason is simple. The Chinese Communist Party was founded in the 1920s and came to power in 1949. Within this short span of time the masses have lost faith in communist ideology, and members of the party these days pay mere lip service to the ideological justifications of the party. Conversely, the institution of the Dalai Lamas as a political force is more than 300 years old.

These days the Dalai Lama is recognized by Tibetans throughout the world as the heart of Tibetan nationalism. How can a party which has lost its soul outlast an institution which symbolizes the very soul of a people? For these reasons it is imperative for China to review and re-assess its current hardline stance towards Tibet.

China must re-start its stalled peace process over Tibet and consider His Holiness the Dalai Lama as a vital and active partner in the procedures. If China does this it will have won a powerful

ally and companion along the road to peace, stability and continued prosperity.

MAJOR DISPUTES

People's Republic of China

The Republic of China (ROC), now based in Taiwan, is involved in territorial disputes with many governments bordering China.

Due to the One-China policy, it has no formal diplomatic relations with any of these states. The ROC recognises neither the People's Republic of China (PRC) nor its border agreements or treaties with any other countries.

Article 4 of the Constitution of the Republic of China states that "The territory of the Republic of China according to its existing national boundaries shall not be altered except by resolution of the National Assembly."

Section 5 of Article 4 of the Additional Articles of the Constitution of the Republic of China now overrides this provision. Thus ROC is involved with all Sino-Indian border conflicts.

Aksai Chin

Aksai Chin, also Aksayqin, Akesaiqin or Akesai Qin, is a disputed region located in the northwestern part of the Tibetan Plateau and immediately south of the western Kunlun Mountains. It is entirely administered by the People's Republic of China as a part of Hotan County in the Hotan Prefecture of Xinjiang Autonomous Region. India considers it as a part of its state of Jammu and Kashmir.

What little evidence exists suggests that the few true locals in Aksai Chin have Buddhist beliefs, although some Muslim Uyghurs may also live in the area because of the trade between Tibet and Xinjiang. India claims the area as a part of the Ladakh District of the state of Jammu and Kashmir. Both sides in the dispute have agreed to respect the Line of Actual Control.

Depsang Plains

The Depsang Plains are located on the border of the Indian state of Jammu and Kashmir and the disputed zone of Aksai Chin.

The Chinese Army occupied most of the plains in 1962. The area is currently disputed, with both China occupying and laying claim to the eastern portion of the Depsang Plains, and India occupying the western portion and laying claim to all of the Depsang Plains.

Disputed Areas Located near Aksai Chin

Demchok, Chumar, Kaurik, Shipki Pass, Jadh, and Lapthal. All occupied by India except for most of the Demchok parcel.

Trans-Karakoram Tract

The Trans-Karakoram Tract is an area of nearly 5,800 km^2 (2,239 sq mi) along both sides of the Shaksgam River, is entirely administered by the People's Republic of China as a part of Kargilik County and Taxkorgan Tajik Autonomous County in the Kashgar Prefecture of Xinjiang Autonomous Region, but was claimed by Pakistan until 1963. It is still claimed by India as part of the state of Jammu and Kashmir. Pakistan gave up its claim to the tract under a border agreement with China in 1963 with the proviso that the settlement was subject to the final solution of the Kashmir dispute.

Arunachal Pradesh

Arunachal Pradesh is a state of India, located in the far northeast. It borders the states of Assam and Nagalandto the south, and shares international borders with Burma in the east, Bhutan in the west, and the People's Republic of China in the north. The majority of the territory is claimed by the People's Republic of China as part of South Tibet. The northern border of Arunachal Pradesh reflects the McMahon Line, a controversial 1914 treaty between the United Kingdom and the Tibetan government which was never accepted by the Chinese government and not broadly enforced by the Indian government until 1950.

Pakistan

JAMMU AND KASMIR. This is the major dispute between Pakistan and India. Two wars have been fought between the two countries. In addition to the disputed Indian state of Jammu and Kashmir a few other territorial disputes exist between Pakistan and India.

Siachen Glacier

The Siachen Glacier is located in the eastern Karakoram Mountains in the Himalayas at about 35.5°N 77.0°E, just east of the Actual Ground Position Line between India-Pakistan. India controls part of the Siachen Glacier, Pakistan controls the rest. At 70 km (43 mi) long, it is the longest glacier in the Karakoram and second-longest in the world's non-polar areas.

Saltoro Mountains

The Saltoro Mountains (also known as Saltoro Parvat or Saltoro Muztagh) are a subrange of the Karakoram Range. They are located in the heart of the Karakoram, on the southwest side of the Siachen Glacier. They are claimed as part of Jammu and Kashmir by India and as part of Gilgit-Baltistan by Pakistan. In 1984, India assumed military control of the main peaks and passes of the range, with Pakistani forces into the glacial valleys just to the west. Hence, despite high peaks and dramatic climbing opportunities, they are little visited except by military forces due to the ongoing Siachen conflict.

Sir Creek

The Sir Creek is a 96 km (60 mi) strip of water disputed between India and Pakistan in the Rann of Kutch marshlands. Pakistan claims the line to follow the eastern shore of the estuary while India claims a center line (differing interpretations of *paragraphs 9 and 10* of the *Bombay Government Resolution of 1914* signed between then the Government of Sindh and Rao Maharaj of Kutch. Thus affecting the maritime boundary negotiations in Arabian Sea waters. Before India's independence, the provincial region was a part of the Bombay Presidency of British India. After India's independence in 1947, Sindh became a part of Pakistan while Kutch remained a part of India.

MINOR DISPUTES

Bangladesh

- Daikhata-Dumabari
- Lathitila

- Muhurichar river island
- Pyrdiwah

Boraibari

Boraibari falls under the adverse possession category with the map suggesting that it should be within India but it has been controlled by Bangladesh authorities since 1971.

Indo-Bangladesh Enclaves

The enclaves between India and Bangladesh border in the Indian state of West Bengal remain an issue, though recent yet-to-be finalised negotiations have reportedly finally resolved the problems in this Chitmahal area. India has about 92 enclaves of Bangladesh territory, and 106 exclaves of India are surrounded by Bangladeshi soil.

The enclaves were reputedly part of a high stake card or chess games centuries ago between two regional kings, the Raja of Cooch Behar and the Maharaja of Rangpurand the result of a confused outcome of a treaty between the Kingdom of Koch Bihar and the Mughal Empire. After the partition of India in 1947, Cooch Behar district was merged with India and Rangpur went to then East Pakistan, which became Bangladesh in 1971. In 1974, both countries agreed to exchange the enclaves or at least provide easy access to them, but since then little has materialised. Talks between the two countries on the issue resumed in 2001, but the lack of a concrete time frame has relegated the issue to the back burner.

New Moore / South Talpatti

New Moore (as it was known in India) or South Talpatti Island (as it was known in Bangladesh) was a small uninhabited offshore sandbar landform in the Bay of Bengal, off the coast of the Ganges-Brahmaputra Delta region. It emerged in the Bay of Bengal on the Bangladesh side of river that makes the boundary between India and Bangladesh in the aftermath of the Bhola cyclone in 1970, and disappeared before or during Cyclone Aila in 2009.

Although the island was uninhabited and there were no permanent settlements or stations located on it, both India and Bangladesh claimed sovereignty over it. The issue of sovereignty

was also a part of the larger dispute over the methodology of settling the maritime boundary between the two nations.

Nepal

- Antudanda
- Nawalparasi
- Kalapani
- Susta

Kalapani

Kalapani is an area under territorial dispute in Darchula District, Nepal and Pithoragarh district of India.

Although claimed by Nepal, Kalapaani has been occupied by India's Indo-Tibetan border security forces since the 1962 border war with China. Nepal claims that the river cited in the 1816 treaty should be followed all the way to its Himalayan source as the boundary, rather than the ridge line east of the river claimed by India. The river borders the Nepalese zone of Mahakali and the Indian state of Uttarakhand. The Sugauli Treaty signed by Nepal and British India in 1816 utilizes the Kali River as Nepal's western boundary with India. Subsequent maps drawn by British surveyors show the source of the boundary river at different places. This discrepancy in locating the source of the river led to boundary disputes between India and Nepal, with each country producing maps supporting their own claims. The Kalapani River runs through an area that includes a disputed area of about 400 km^2 around the source of the river although the exact size of the disputed area varies from source to source.

Susta

Susta is an area under territorial dispute currently in Tribenisusta, Nepal and near Nichaul, Uttar Pradesh, India. The area under dispute totals over 14,000 hectars.

Sri Lanka

Kachchatheevu

Kachchatheevu or Katchatheevu or Kachativu is an uninhabited island belonging to [Sri Lanka - Disputed] Comprising

a Area of 285 Acres. This island was given to Sri Lanka by India in 1974. It has a Catholic shrine and has been declared as a sacred area by the government of Sri Lanka. In 2001, the Tamil Government called for the return of the island but Mr. Mahinda Rajapaksa, former Fisheries and Aquatic Resources Minister of Sri Lanka and current president, declined. He said that, 'It is impossible to give it back to them as it has been recognized by the international community as an integral part of our country since it was handed over by lateIndira Gandhi.'

INDIA'S BOUNDARY DISPUTES WITH CHINA, NEPAL, AND PAKISTAN

The recent detonation of a series of nuclear devices by India and Pakistan has increased tension in South Asia and threatens to inflame long-standing boundary disputes that India has with China, Nepal, and Pakistan. The disputes with China and Pakistan have already triggered several wars. The new Hindu-nationalist government in New Delhi has reversed movement toward détente with Beijing and Islamabad. The areas in contention with China and Pakistan are among the largest land-boundary disputes in the world. The Indo-Nepali dispute over Kalapani is more recent and involves a small area.

DRAWING THE INDO-PAKISTANI BOUNDARY

The 1947 partition of South Asia has had lasting repercussions not only for the region, but also for the larger international community. Border tensions between India and Pakistan have taken on a new magnitude since both countries carried out nuclear tests in May 1998. Surprisingly, historians have paid little attention to the creation of the Indo-Pakistani boundary, a key element of the 1947 division. This article analyzes the problematic procedure and format of the body responsible for delineating that boundary through the province of Punjab, the Radcliffe Boundary Commission.

It is part of a larger project that will examine links between the boundary-making process and the repercussions of partition, particularly mass violence. The commission takes its name from its chairman, Sir Cyril Radcliffe. In the end, his boundary-making

effort was a failure in terms of boundary-making, but a striking success in terms of providing political cover to all sides.

The British seized the opportunity to withdraw from their onerous Indian responsibilities as quickly as possible; the Indian National Congress, the avowedly secular but primarily Hindu party headed by Jawaharlal Nehru and Sardar Patel, took control of India, as it had desired for so long. The Muslim League, which claimed to represent South Asia's Muslims and was led by Muhammad Ali Jinnah, won Pakistan, the sovereign Muslim state for which it had campaigned.

Although the British had, in 1946, considered leaving India piecemeal, transferring power to individual provences as they withdrew, they concluded that such an approach was impractical. without defining the entity or entities that would come into power, they concluded that such an approach was impractical. It would not be possible to hand over power without making it clear what international entity would take on that power; in order to define a new international entity, a new boundary was necessary. From a certain perspective, however, a rigorously and properly delineated boundary was not necessary to accomplish these political ends—any boundary line would do. Due to this fact and to a myriad of political pressures, the Radcliffe Commission failed to draw a geopolitically sound line delineated and demarcated in accordance with accepted international procedure. The Punjab's population distribution was such that there was no line that could neatly divide Hindus, Muslims, and Sikhs. Radcliffe's line was far from perfect, but it is important to note that alternative borders would not necessarily have provided a significant improvement. There is, in contrast, a great deal to be said about flaws in the boundary-making *procedure*—and why those flaws existed.

Significance

This territorial division is significant on multiple levels. As an episode in imperial history, it marked the beginning of a global trend towards decolonization. For South Asian history, it meant independence for India and Pakistan. Unfortunately, it also inaugurated Indo-Pakistani tension. Conflict between Hindus and Muslims had existed on the subcontinent, to a greater or lesser

degree, for many centuries, but the partition brought that conflict to the international level – and exacerbated it. The results include three wars, in 1948, 1965, and 1971, as well as the Kargil conflict of 1999. The problem of Indo-Pakistani tension took on greater urgency when both India and Pakistan tested their nuclear weapons in May 1998, and current events in South Asia demonstrate the need for continued attention to and greater understanding of this vital region. How did this division intensify the very conflict it was intended to resolve? Part of the answer lies in the drawing of the boundary. My primary goal is to clarify and analyze the boundary-making process, but having identified specific flaws in this division, I hope to lay them out in terms that might be useful for decision-makers considering partition as a tool to resolve conflict in other regions of the world.

Methodology

Because this project focuses on a controversial episode, which reasonable historians describe differently according to their own national or political biases, my first research priority was balancing these varied perspectives. Accordingly, I gathered archival material and conducted interviews in England, Pakistan, and India. In all three countries, I focused on government documents, examining material relating to the work of the Radcliffe Commission and to the repercussions of the Radcliffe Line. I also examined private papers, mostly of British officials serving the raj, but also, where accessible, the papers of Indian and Pakistani leaders. Regrettably, Radcliffe destroyed all his papers before he left India—in keeping, his biographer claims, with a lifelong habit of discarding material he no longer needed. As a result, it may be impossible ever to clarify Radcliffe's thinking completely. I have attempted to compensate through archival research and through interviews with Radcliffe's stepson and executor, with his private secretary on the Boundary Commission, and with the last surviving Pakistani official associated with the Punjab Boundary Commission.

This research explores the balance between structural influences and the role of individuals. My story centers on a small number of individuals: Radcliffe, the man who had responsibility for the boundary line; Mountbatten, the last viceroy of India; Nehru and Patel, leaders of the Indian National Congress; and

Jinnah, head of the Muslim League. But my argument also has a great deal to do with the sweeping drives of British imperialism, Indian and Pakistani nationalism, and decolonization. My conclusions about the forces that shaped the Indo-Pakistani boundary would seem to support a structural approach, but the lessons of this particular division could be read another way. If at any point enough individuals had decided to take another path—for example, if Radcliffe had withdrawn his services once he reached India and was informed of the August 15 deadline—the outcome could have been dramatically different. Alternatively, if the key individuals had different backgrounds—for example, if all the Indian leaders had not been lawyers, but rather businessmen or engineers—the outcome could again have been very different. The story of the Radcliffe Commission concerns individuals attempting to do what they saw as best, and as a result both bowing to and struggling against the pressures of larger structural forces.

Historical Context

The 1947 partition was shaped not only by decades of Indian nationalist pressure on the British Government and by the rise of civil unrest in the subcontinent after World War Two, but also by Britain's precarious economic position in the aftermath of the war. After nearly two centuries as an economic asset, British India had become a liability at a time when Britain could least afford it. In addition, American pressure to decolonize the subcontinent influenced both international and British domestic opinion against the *raj*. British India became a political and symbolic liability as well as an economic problem. These factors, combined with domestic political considerations for the newly elected Labour Party, meant that ridding itself of its responsibilities in India suddenly became a priority to His Majesty's Government (HMG).

However, Indian independence had not always been such an urgent goal for the British Government. The first half of the twentieth century saw a series of small steps towards self-government in South Asia. Traditional imperialist historiography holds that these ventures marked carefully incremented progress, part of the process of training Indians to govern themselves. Other interpretations, including but not confined to South Asian

nationalist schools, argue that these steps were actually sops intended to keep nationalists satisfied enough to prevent a more serious threat to British rule. This view holds that HMG had no intention of letting go its "jewel in the crown"—until it had no choice. Many historians, imperialist and nationalist alike, trace the roots of partition to the Morley-Minto reforms of 1909. These changes increased Indian participation in their own governance, anticipating an eventual move to self-rule. By creating separate electorates for different religious groups, however, these reforms also "embed[ded] deeply in Indian life the idea that its society consisted of groups set apart from each other.... The result was the flowering of a new communal rhetoric, and ultimately, of the Pakistan movement." Politicians found religious rhetoric useful for rallying support, with dangerous results. The elections of 1937 and 1945-46, in which both Congress and the Muslim League rhetoric played on communal themes, provided further evidence of a lack of political cooperation at the highest levels.

With the onset of the Second World War, the Government of India found itself in a difficult position. HMG declared war on India's behalf, without even a pretense of consulting Indian leaders. Indian politicians and public opinion were outraged. The prospect of civil unrest loomed. In 1942, with the Allies in urgent need of a reliable Indian base, Churchill dispatched Sir Stafford Cripps to India at the head of a Cabinet delegation charged with exploring the possibility of self-government after the war. Cripps offered an implicit promise that if India fought in World War II it would be granted freedom; Congress rejected this offer with Gandhi's memorable phrase that it was a "post-dated cheque on a bank that was failing." In the aftermath of Cripps's failed mission, Gandhi launched the "Quit India" movement, which the British repressed violently. Most Indians subsided into more or less supportive attitudes.

With the end of the war, Indian leaders and people alike expected to be repaid, with independence, for their wartime backing. In Britain, the Conservatives were voted out and the Labour Party took power, under Clement Attlee. Meanwhile, the India Office was losing patience with its viceroy, Lord Wavell. Relations between the India Office and Wavell had been steadily worsening throughout 1946.

Wavell, a career military man whose stolid exterior concealed a bent for writing poetry, had been viceroy of India since 1943. Left with the difficult job of guiding India through treacherous post-war waters, he sent increasingly blunt warnings to London that their Indian policies were misguided and inadequate to the challenges ahead. Lord Pethick-Lawrence, Britain's Secretary of State for India, resented these warnings and paid less attention to them as time went on. In particular, Wavell's outline of potential partition boundaries, the first serious discussion of the issue, received little attention. However, Wavell's "Breakdown Plan," calling for a withdrawal of all British presence in South Asia, alarmed HMG. Attlee sent another cabinet mission to India in hopes of negotiating a less drastic outcome. The resulting proposal, known as the "ABC Plan," called for a loose federation to consist of three groups of provinces, each of which had the option to "opt out" of the federation. This proposal met a curious reception. It was first accepted, then rejected, by Congress; the Muslim League initially announced that it would cooperate, but in the aftermath of the Congress decision it renounced constitutional methods and declared "Direct Action" Day on August 16, 1946. "Direct Action Day" became the "Great Calcutta Killing," and the next thirteen months saw rioting and violence across North India.

By the beginning of 1947, Pethick-Lawrence and Attlee had lost all confidence in Wavell, regarding him as "frankly defeatist." In February 1947, they asked him to resign, appointing Lord Louis Mountbatten, a career naval officer and cousin to the king, in his place. Although Mountbatten was given a June 1948 deadline by which to disentangle Britain from India, he concluded shortly after his arrival in India that a rapprochement between the various parties was impossible. Within a few months he decided to move the decolonization deadline up, to August 15, 1947.

INDIA-CHINA BORDER DISPUTE

The continuing (since April 15,2013) Chinese troop intrusion (about 20 troops) 10 kms into Indian territory near Burthe in the Daulat Beg Oldi (DBO) area of Eastern Ladakh in the western sector of the Sino-Indian border should be a matter for careful analysis and concern, but not alarm.

A spokesman of the Chinese Foreign Office has denied any Chinese intrusion into Indian territory in this area. The Government of India, for the present, has been treating it as one of those intrusions which take place sometimes due to differing perceptions of the Line of Actual Control (LAC) in this area and trying to deal with it through the normal mechanism for handling such issues without disturbing peace and tranquillity across the border. There is no evidence to show that this could be a prelude to a major Chinese assertion of territorial sovereignty in this area. The Chinese aim seems to be to re-assert their claim of sovereignty over this area without disturbing peace and tranquillity. The Chinese troops are presently camping in the area in a tent. We will have reasons to be more than concerned only if they stay put there and construct permanent defences as they often do in the uninhabited islands of the South China Sea.

Since last year, the Chinese have been a little more assertive of their sovereignty claims over the islands of the South and East China Seas. They have reportedly constructed permanent defensive and administrative structures on some of the islands over which they have disputes with Vietnam and the Philippines. In the East China Sea, where they have sovereignty disputes with Japan, they have avoided any such construction, but stepped up seemingly aggressive air and naval patrols of the areas in the vicinity of these islands. The Chinese Navy has also stepped up its visits to the islands in the South China Sea claimed by Beijing.

Till now we have seen greater Chinese activism in the enforcement of their sovereignty claims only in the South and East China seas, but not across the Sino-Indian border. If the Chinese troops stay put in the Burthe area and construct defensive structures in the area, that will be an indicator of their deciding to follow a similar policy of activism across the Sino-Indian border too. That should add to our border concerns. We may have to revisit our peace and tranquillity strategy and think of a more activist policy to face the Chinese activism.

In the Western sector of the border, which is largely unpopulated, the status quo favours the Chinese. Since 1962, they are already in occupation of whatever territory they have claimed. We have very few options to re-assert our sovereignty in any area

of this sector which is under Chinese control. In the Eastern sector (Arunachal Pradesh, which the Chinese call Southern Tibet), the area is populated and the status quo favours India. Even though our defensive and administrative infrastructure in the Arunachal Pradesh area is not comparable with the Chinese infrastructure in the Tibet Autonomous Region (TAR), we are in a much stronger position in the Eastern sector than in the Western.

While the Chinese continue to repeat from time to time their claims to the Arunachal Pradesh area, they have avoided in the Eastern sector the kind of ground activism that one comes across in the Western sector. There is a noticeable keenness on the part of both China and India to avoid any provocative incident either in the Eastern or Western sector. The Chinese are unlikely to relent in their claims to Indian territory in the Eastern sector till after they have succeeded in imposing on the Tibetans a Dalai Lama chosen by the Communist Party of China (CPC) with the help of the Panchen Lama chosen by the CPC.

The wave of self-immolations (115 incidents so far) in the Tibetan areas of China since March 2009 has created concerns in Chinese mind of possible political instability in the Tibetan areas after His Holiness the Dalai Lama when the CPC imposes its nominee on the Tibetans.

The older generation of Tibetans continues to abide by His Holiness' exhortations for peaceful means of protest. The Chinese are worried that the GenNext of Tibetans represented by organisations such as the Tibetan Youth Congress (TYC) may take to violent means to resist the imposition of a Dalai Lama chosen by the CPC. In their calculation, this may necessitate action by the PLA in the populated areas of Arunachal Pradesh. Till Tibet is pacified without fears of any further trouble and the Chinese have forced the Tibetans to accept their nominee as the Dalai Lama, Beijing would like to maintain its claim to Arunachal Pradesh to justify action by the PLA in that area to contain trouble, if need be.

If they now make a deal with India recognising Arunachal Pradesh as an integral part of India, they will not be able to act in that area. By recognising Tibet as an integral part of China we have given up our options for action in Tibet. The Chinese would

not want to commit the same mistake by recognising Arunachal Pradesh as an integral part of India. They will, therefore, keep the Arunachal Pradesh issue alive till they have forced the Tibetans to accept their decision regarding succession of His Holiness. We should factor this into our border strategies relating to China.

THE SINO/INDIAN DISPUTE

Ever since its establishment in 1949, the attitude of the Communist Chinese Government towards India has been bound up with the Tibetan issue. India had, on gaining independence in 1947, inherited the British "special position" in Tibet, along with the Mission in Lhasa and trade agencies in larger towns. It had retained the services of British officials stationed in Tibet. When, in 1949, Tibetan leaders made their bid to contact foreign Governments, they first contacted these officials, and it was only a short step for the suspicious minded Chinese to regard this as evidence of Indian collusion with the British.

The Communist Chinese also had ideological reasons for believing that such collusion existed. At the time of their coming to power, Moscow was propagating the line of a world divided into two camps, with the Indian Government depicted as a tool of British imperialism and firmly situated in the opposing camp. The Communist Chinese leaders, who previously had had little contact with the outside world, faithfully repeated these accusations against Nehru and his Government.

Following the Chinese occupation of Tibet in late 1950, Peking's suspicions of the Indians were further aroused when Nehru, in notes to the Chinese Government, expressed the "surprise and regret" of his Government at the Chinese action. He described as "deplorable" the Chinese use of force in Tibet.

Standard diplomatic practice stipulates that a state does not criticise the behaviour of another state acting within its own territorial boundaries unless there are special reasons for so doing. The Indians justified their criticism of the Chinese on the ground of their special interest in Tibet, from which the Chinese inferred that the Indians were implying some restriction on Chinese sovereignty. A sharp reply was received from the Chinese accusing the Indians of unwarranted interference and claiming that the

policy of the Indian Government was "affected by foreign influences hostile to China in Tibet".

Nevertheless, whatever suspicions the Chinese may have felt about the Indians in 1949-50 must to some extent have been allayed by subsequent developments. India opposed the 1950 Tibetan appeal to the United Nations; it was one of the few non-communist countries not to condemn China's intervention in the Korean War; it sought to have China seated an the United Nations. The culmination of these moves to improve relations with China was the signing, in April 1954, of an agreement by which India recognised without qualification China's sovereignty over Tibet and conceded many of India's former rights there. A few months later the Chinese Premier, Chou En-lai, paid a successful visit to India, and in October of the same year Nehru visited Peking.

The very considerable improvement in Sino/Indian relations from 1950 to 1954 was on the Indian side almost entirely the result of efforts by Nehru, who saw friendship between China and India as the starting point of a new order in world affairs. It must have been obvious to the Chinese that considerable opposition to Nehru's pro-China policies, at least as far as Tibet was concerned, existed both within and outside the Indian Government. It should also have been clear that problems were going to arise over wide discrepancies in the claimed Sino/Indian border, as shown in maps published by both sides.

However, as long as Nehru's China policy appeared to produce results, his opposition in India remained silent. It was important for both Nehru and the Chinese that this policy continued to appear to give results, and hence the efforts made by both sides to keep intact the edifice of good relations. The Chinese, under the 1954 agreement, allowed India to maintain certain trade and pilgrimage rights in Tibet.

They sought to play down the significance of border differences, stating that they had simply inherited their claimed Sino/Indian frontier from the pre-1949 Nationalist Government and that it would be "revised" in due course. Nehru, for his part, avoided public mention of the reality and extent of border differences, and it seemed that both sides were moving towards a compromise settlement of the question.

What were these differences, and what evidence was there that both sides were in fact prepared to compromise? The Sino/Indian border can be divided into three sectors: (i) an eastern sector where 99,000 square kilometres of territory described by the Indians as the Northeast Frontier Agency, or N.E.F.A is in dispute: (ii) a middle sector where some 2.000 square kilometres of territory on either side of the main Himalayan passes is disputed: and (iii) a western sector where the Indian province of Ladakh borders on Tibet and Sinkiang and where both the Indian/Tibet and Indian/Sinkiang borders are disputed, in particular the ownership of some 30,000 square kilometres of high plateau country known as the Aksai Chin.

To an outside observer looking at the frontier as it stands, an apparent basis for a compromise settlement would be for China to drop its claim to the N.E.F.A. in exchange for India dropping its claim to the Aksai Chin, with both sides making concessions over the middle sector and the Ladakh/Tibetan border. Such a settlement accords with the realities of both geography and administrative control two important criteria in the settlement of border disputes. The N.E.F.A. lies to the south of the Himalayan watershed and is controlled by India. The Aksai Chin, for the most part, lies to the north of the main range, and the Chinese claim to have controlled the area since 1950. In 1956-7, they built a strategic road across the Aksai Chin, linking Sinkiang with Tibet. That the Indians learnt about the road only from a map published by the Chinese in 1958 is substantial evidence that India was not in control of the area.

The historical basis of the border is more confused. The Indian claim to the N.E.F.A. rests almost entirely on acceptance of the McMahon Line, a line agreed to by the Tibetans and British in 1914 as the border in this area. In the Aksai Chin area no agreement has ever been reached on the alignment of the border. Nevertheless, if both sides were to take a generous view of the historical data, a basis for a N.E.F.A./Aksai Chin exchange could be found.

During the post-1954 honeymoon period of Sino/Indian relations, both sides did in fact seem prepared to take a generous view of the situation and to move towards a compromise settlement. In 1956, Chou En-lai admitted privately to Nehru that, although

lie thought the McMahon line "was not fair", nevertheless China would accept the line as the border with India after they had "consulted with the Tibetan authorities". Chinese recognition of the McMahon Line was also implied when its eastern extension was accepted as a basis for border negotiations with Burma, and by Chinese de facto acceptance of the line as the dividing line between Chinese and Indian forces in the area.

Nehru, for his part, appeared willing to play down the Indian claims to the Aksai Chin. He tried to delay disclosure if the news that the Chinese had built a road in the area. After the news had been revealed, he sought to play down the economic significance of the area, describing it as a "barren tundra".

He even went so far as to cast doubt on the validity of the Indian claim to the area. In statements to the Indian Parliament during early 1959, Nehru pointed out that "during British rule, this area was neither inhabited: nor were there any outposts", adding that "this place, Aksai Chin area, is distinguish completely from other areas. It is a matter for argument which part belongs to us and which part belongs to somebody else. It is not clear".

Nehru's efforts to take the heat out of the Aksai Chin question were not entirely successful. (One of his critics even suggested building an atomic reactor in the area to promote its economic development.) News of the Chinese road in the area appeared to trigger off long-suppressed Indian sensitivity over the border issue, and, in August 1958, the Indian Government made a formal claim to the disputed territory in all three sectors. In a letter to Nehru of January 1959, Chou En-lai claimed that the Aksai Chin was Chinese territory and added that the McMahon Line was a "product of British aggression", illegal, and had "never been recognised by the Chinese Central Government". He proposed that the existing status quo he maintained, however, pending a negotiated settlement of the dispute, and added that China would take a "realistic attitude" over the McMahon Line.*

The Tibetan uprising of March 1959 upset the delicate balance of Sino/Indian relations. Reports of Chinese military action to suppress the uprising, together with the sight of thousands of Tibetan refugees crossing into Indian territory, quickly aroused feelings of alarm and anger in India, particularly among those

who believed their country had an historic interest in Tibet. Nehru's Right-Wing critics charged that India should never have allowed the Chinese into Tibet in the first place. Nehru, influenced possibly both by Indian public opinion and his own feelings on the question, came out in open condemnation of Chinese behaviour in Tibet.

The Chinese reacted even more strongly than they had in 1950. Nehru, in addition to condemning the Chinese, had spoken of his sympathy with "the aspirations of the Tibetans for autonomy". He had given asylum to the Dalai Lama, who was also allowed facilities to make his 1959 appeal for U. N. action over Tibet. And finally, the Chinese had reason to believe that the Tibetan guerrillas were receiving arms from across the Indian border.

In May 1959 the Chinese published a long article urging, almost begging, Nehru not to be swayed by his reactionary Right-Wing critics and to return to the path of Sino/Indian friendship. With a frankness and detail probably unmatched by any other Chinese statement on foreign policy, the article set out the Chinese case over Tibet, and accused the Indians of unjustified interference. Indian trade with Tibet was greatly restricted. Clashes involving casualties occurred at several points along the disputed border as the Chinese Army extended its control over border areas in an effort to restrict the move- court of Tibetans across the frontier.

These border clashes, following in the wake of the Tibetan uprising, appeared to put an end to Nehru's willingness to compromise over the border dispute. Having earlier in 1959 cast doubt on the Indian claim to the Aksai Chin, in September he stated before the Indian Parliament that the Chinese claims were "absurd" and would mean "handing over the Himalayas to them as a gift". A Chinese call in November 1959 for negotiations and a twenty-kilometre military withdrawal from the McMahon Line in the east and the "line of actual control" in the west to prevent a recurrence of border clashes was met with an Indian demand for a prior Chinese withdrawal from the Aksai Chin. A Chinese reply pointing out that this should also be paralleled by an Indian withdrawal from the NE.F.A. was ignored. In the end the Chinese appeared to settle for a freezing of the existing status quo - without negotiations or a twenty-kilometre withdrawal.

However, if the Chinese were happy to keep things as they were (keeping also their road across the Aksai Chin), Nehru and his Government were not. Throughout 1960-61 Indian opinion progressively hardened, and demands for the Government to do something about Tibet and the disputed border increased. The army was given full control over the frontier districts and it proceeded to build up its strength in these areas.

During the summer (northern) of 1962, Indian military patrols repeatedly crossed the Chinese-claimed line of actual control in the western sector of the frontier. Posts were established well behind the Chinese forward positions in territory claimed and occupied by the Chinese. Frequent and insistent Chinese protests were met with the bald statement that the Indians were merely operating in Indian territory. By August 14, Nehru was able to announce that India had three times as many posts in the western sector as the Chinese. He asked for a free hand to continue the build-up of Indian strength in the area.

The Chinese had repeatedly warned that a continuation of such activity would end in hostilities. On July 9, they had warned the Indians "to rein in on the brink of the precipice". On August 4, they called for immediate negotiations on the border. The Indians replied that negotiations could not be held until the Chinese had ceased their occupation of "every square inch of sacred Indian territory", and that the Chinese must first "vacate their aggression" in the Aksai Chin. The Chinese replied on September 13 proposing talks to begin on October 15 "without preconditions", that is, without a Chinese withdrawal from the Aksai Chin. The Indians refused the offer.

While Indian military pressure was building up along the Chinese-claimed border in the western sector, a curious situation was developing along the McMahon Line in the eastern sector. The Indians claim that at its western end the McMahon Line was not accurately drawn: that it was meant to have followed the crest of a line of hills known as the Thag La ridge. The Chinese claim, and have produced the original McMahon Line from the Tibetan archives to prove their point, that the line as originally drawn lies approximately twelve miles south of this ridge along the southern side of a small river valley. (Western maps show the McMahon

Line in conformity with the Chinese claim.) The area between the Indian and Chinese versions of the McMahon Line is described by the Indians as the Dho La strip.

This was not the only unilateral revision of the McMahon Line carried out by the Indians. In his letter to Chou En-lai of September 29, 1959, Nehru admitted that in the Migyitun area (to the east of the Dho La strip) the border shown on Indian maps "differs slightly from the boundary shown in the Treaty map". He claimed that when the McMahon line was drawn, "the exact topographical features in this area were not known". The Indians have also now come to admit that "blind adherence" to the original McMahon Line would leave the Dho La strip on the Chinese side at the border.

It is not clear who first occupied the Dho La strip. The Chinese claim that the area had always been under their control and that Indian troops moved in during 1962. The Indians claim they had long occupied the area and that the Chinese began a to establish posts in the area after September 8, 1962. What is clear is that on October 12, 1962, Nehru announced in the Indian Parliament that he had given the order to drive the Chinese out of the Dho La strip.

Eight days later, on October 20, the Chinese attacked in force across the Thagla La ridge and into the disputed strip, while advancing their troops into the Chinese-claimed territory in the western sector where the Indians had earlier established posts. Four days later, the Chinese called for a ceasefire to be followed by a withdrawal of both sides from the line that separated them at that moment (the so-called October 24 line of actual control). Failing to get a satisfactory response from the Indians, they advanced troops south of the Dho La strip into the N.E.F.A., defeating Indian military forces in the area. Two weeks later, they withdrew to the positions occupied on October 24. The main point of contention between the Chinese and Indians ever since has been whether the Chinese should maintain their October 24 positions or withdraw further to the positions they occupied before fighting broke out.

The Chinese attack of October 1962 has led to an almost complete breakdown in relations between China and India. The level of each country's diplomatic representation in the other has

been greatly reduced. Many thousands of Chinese nationals have been expelled from India. The few Indian nationals living in China have, in one way or another, been forced to leave. Border incidents have continued. Both sides have launched extreme propaganda campaigns against each other, the Chinese denouncing Nehru as a representative of the "big bourgeoisie" and a tool for U. S. aggressive designs against Tibet, while the Indians denounce the Chinese for having aggressive, imperialist designs against Indian territory. Both sides have gone to great lengths to discredit each other inter- nationally. Both sides have increased their military preparedness along the Himalayan frontier, particularly India, which has doubled its military budget to a level it cannot afford.

The question thus arises: Who is primarily to blame for the hostility in Sino/Indian relations? From the account already given, the primary cause of the hostility was the post-1959 dispute over the Sino/Indian border leading to the Chinese attack of October 20. But why the sudden emergence of such a dispute between two countries previously enjoying good relations?

Reverting to the terminology of our previous discussion on hostility between states, both sides see the breakdown in relations as being caused by the active hostility of the other side. This hostility, they claim, is both ideologically and national- interest based. The Chinese are accused of having acted in a hostile manner out of a desire to acquire territory and out of strong ideological dislike for the Indian Government. The Chinese claim the Indians have designs against Chinese territory and that their Government is under the influence of anti-Chinese and pro-U. S. reactionary elements.

Both sides realise that they have somehow or other to explain why the other side suddenly, in 1959, decided that its interests were no longer served by the maintenance of normal relations. The Indian explanation is that Chinese pre-1959 policy was designed to lull India into a false sense of security and so facilitate Chinese ambitions. The Chinese explanation was that reactionary elements began to gain the upper hand in the Indian Government in 1959, and point to the post-1959 increase in U. S. aid to India as evidence. In fact there is good reason to believe that the hostility shown by each side towards the other was reactive rather than

active: that each side was reacting to the believed hostility of the other. To take the Chinese side of things first.

In terms of the account already given, it seems likely that the Chinese attack of October 20, 1962, was primarily a reaction to Indian military pressure along the disputed frontier during preceding months. It could be argued, however. that the behaviour of the Chinese before October 20, and in particular their propaganda attacks against the Indians from 1960 onwards, cannot be explained simply as a reaction to previous events: that overall Chinese behaviour must therefore include some aggressive component.

The Chinese had in fact made their first hostile move against the Indians back in 1959 when they restricted Indian trading and other rights in Tibet. The Chinese had also, according to the Indians, extended somewhat the area they claimed in the western sector. And they had, according to the Indians, been responsible for the 1959 border clashes already mentioned. The Indian charge is based on alleged differences between the frontier claimed by the Chinese to 1956 and that shown on a map of the claimed Sino/Indian frontier handed to the Indians by the Chinese in 1960. The Chinese deny any difference between the two lines.

Unless these apparently hostile acts of the Chinese can be explained in reactive terms., in terms of their reacting to previous Indian actions, then it would seem that the Chinese had taken the initiative in hostility towards India and were largely responsible for the eventual breakdown in relations.

The hardening of the Chinese attitude towards India in 1959 was clearly related to Tibetan developments in that year. In judging the behaviour of the Chinese, we need, in effect, to ask whether their sensitivity over Tibet was sufficient to explain this hardening of attitude.

To accept that the Communist Chinese are, in fact extremely sensitive toward Tibet does not necessarily imply a simple acceptance of Chinese propaganda. What we know of Chinese thinking and behaviour, strongly suggests that this sensitivity does exist.

If all non-communist Chinese believe that China has the right to consider Tibet as an integral part of her territory, we should accept that Communist Chinese are equally convinced. If many

non-communist Chinese believe (as they do) that Britain had designs against Tibet, we should accept that Communist Chinese, educated to believe in the evils of US Western imperialism, will be at least equally fearful. We do not need accept that these views are correct; we may even consider they are absurd. But if we are going to get anywhere in trying to understand China's behaviour, we should start from the assumption that these views may be sincerely hold in Peking.

Nor may it be so absurd for the Communist Chinese to think along these lines. The Chinese legal claim to Tibet, it has been argued, appears difficult to refute. As for fears of foreign designs, if the British had earlier convinced themselves that the activities of one Russian agent in Lhasa could lead the politically unstable Tibetans to ally themselves with Tsarist Russia, the Chinese could be excused for thinking that the presence of a British Mission in Lhasa dealing directly with the independent-minded Tibetans and arranging on occasion for the supply of arms from India was evidence of British ambitions eventually to detach Tibet from China, and that India may have inherited these ambitions. Similarly, it would not be entirely surprising if the Chinese viewed the supply of foreign arms to Tibetan guerrillas from northern India in 1959 as confirmation that such ambitions existed. Finally, the Chinese were hound to be impressed by the demands of the Indian Right Wing for action against the Chinese in Tibet.

For example: some weight could be attached to the fact that the then Chief of the Indian Army Staff wrote a not unenthusiastic foreword for a book published in 1961 entitled The Chinese Aggression. The author of the hook, a Dr. Satyanarayan Sinha, predicted that the "clash of the Indochinese weapons for the possession of the Himalayas will lead to making Tibet an independent country again", and suggested ways in which this could be done.

These, then, are the reasons for believing the Chinese may he sensitive about Tibet. Chinese behaviour provides further confirmation. British officials captured in Tibet in 1950 were subjected to long imprisonment and continual interrogation - treatment far more severe than that meted out to British nationals who fell into communist hands elsewhere in China. And there was

Nehru's sad admission to the Indian Parliament in 1959 after talks with Chou En-Iai, of the Chinese having "some sort of kink in their minds... of foreign countries, United Kingdom or America, somehow making incursions into Tibet".

In sum, therefore, it does not seem unreasonable to conclude that the Communist Chinese sincerely believed they had a right to Tibet and that their position in the area was threatened from the direction of India. In which case they would have interpreted Indian behaviour in 1959 as an indication of hostility to which they felt compelled, or entitled, to react.

However, if Chinese behaviour in 1959 can be explained in reactive terms, can the same be said about the Chinese attack of October 1962? Even if the Indian claim to the Dho La strip was doubtful, does not the violence and intensity of the 1962 attack suggest that China was doing more than retaliate for any wrongs she may have believed the Indians to base committed?

By 1962, the Chinese were confronted not only by Indian agitation over Tibet, but also by two further aspects of Indian behaviour which would even more easily have been misunderstood. They were: (i) the Indian military build-up along the Sino/Indian border in 1961-2 and (ii) rigid Indian insistence that, as a precondition to border negotiations, the Chinese must first evacuate the whole of the Aksai Chin.

At the time, the Indians justified their position on negotiations and their military build up in terms of the correctness of their border claims. Indeed, the official Indian position was that the line claimed by India as a border had already been defined historically, and that the only purpose of negotiations was to demarcate on the ground the exact alignment of this border. From this it followed that they were justified (a) in regarding rival Chinese claims, and the occupation of the Aksai Chin, as evidence of Chinese hostility, and (b) in insisting that occupied territory had to be vacated before there could be negotiations. In the meantime the Indians had no alternative but to use military means to counter the Chinese "aggression".

If India was in fact the injured party in the territorial dispute, the Indian attitude over the disputed border would have been explicable at least to an impartial observer, and possibly even to

the less impartial Chinese. There would be less justification for the Chinese reacting in the way they did. But was this the case? To answer this question we need to take a closer look at the historical background to the Sino /Indian frontier, and shall begin with the eastern sector, or N.E.F.A.

Until the 1920's, the region now known as the N.E.F.A. was largely unexplored. It was, and still is, inhabited by tribes of Tibeto-Burmese origin, some of which enjoyed trade and tributary relations with Tibet. Certain areas in the north of the region, the Tawang district for example, were inhabited by Tibetans and were under administrative control from Tibet.

The McMahon Line was negotiated with the Tibetans in 1914 at the time of the Simla Conference. It was drawn as far to the north as possible, since the British at the time sought to forestall a feared Chinese expansion into the foothills bordering the Assam plains. The McMahon Line as part of a bargain whereby the British would press the Chinese to concede territory elsewhere to Tibet.

Even so, the Tibetans were not entirely happy about losing territory south of the McMahon Line, the Tawang district in particular. Their acceptance of the line was conditional on possible future adjustments in their favour. No such adjustments, were ever made. The British also failed to extract the promised concessions from the Chinese, since the latter refused to accept the Convention produced at the Simla Conference. Thus, even as a Tibetan/British frontier, the McMahon Line does not have full validity, particularly as the Tibetans subsequently, in 1936, made a formal request to the British for revision of the line in their favour a request which the British ignored. As late as 1946, the Tibetans were still collecting taxes in the Tawang area. And, in 1947, the Tibetans approached the newly established Indian Government, seeking the "return" of "Tibetan territories" from Assam to Ladakh.

The Indian reply to this approach may be of interest in the light of complaints to be voiced later by the Indians over the manner in which the Chinese spoke of their border claims being inherited from previous Chinese Governments "The Government of India should be glad to have an assurance that it is the intention of the Tibetan Government to continue relations an the existing

basis until new Agreements are any reached... This is the procedure adopted by all other countries with which India has inherited Treaty relations from His Majesty's Government".

The validity of the McMahon Line as a Chinese/Indian frontier is considerably more doubtful. True, in rejecting the draft Simla Contention, the Chinese did not specifically object to the McMahon Line as drawn on the map of Tibet attached to the Convention. But, as the Chinese point out, the then Chinese Government had no way of knowing what this line was supposed to represent, since the terms of the McMahon Line agreement were for some reason kept secret by the British and Tibetans until 1929. It could, in theory, have been a border between Tibet and a Chinese-owned N.E.F.A. Moreover, Chiang Kaishek's Government was later to make it clear to the British (and the Indians after 1947) that it did not accept the McMahon Line.

The Chinese have also pointed out that, since neither the British nor the Chinese regarded Tibet as a sovereign entity, the Tibetans were obliged to obtain Chinese approval for any frontier negotiated with a foreign power. * Failure to obtain this approval, both at the Simla Conference and later, meant that the McMahon Line never at any stage enjoyed international legality. And finally, as the Chinese never tire of pointing out, many Western and Indian maps, including one reproduced in a book by Nehru himself, Discovery of India, have, even in recent years., shown the Sino/ Indian border as running along the edge of the Assam plain in conformity with the traditional Chinese claim.

12

Regional Integration and Cooperation: SAARC: Introduction and Future Challenges

SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION

The South Asian Association for Regional Cooperation (SAARC) is an economic and political organization of eight countries in Southern Asia. It was established on December 8, 1985 by Bangladesh, Bhutan, Maldives, Nepal, Pakistan, India and Sri Lanka. In April 2007, at the Association's 14th summit, Afghanistan became its eighth member.

History

In the late 1970s, Bangladeshi President Ziaur Rahman proposed the creation of a trade bloc consisting of South Asian countries. The idea of regional cooperation in South Asia was again mooted in May 1980. The foreign secretaries of the seven countries met for the first time in Colombo in April 1981.

The Committee of the Whole, which met in Colombo in August 1981, identified five broad areas for regional cooperation. New areas of cooperation were added in the following years.

The objectives of the Association as defined in the Charter are:

- to promote the welfare of the people of South Asia and to improve their quality of life;
- to accelerate economic growth, social progress and cultural development in the region and to provide all individuals the opportunity to live in dignity and to realize their full potential;
- to promote and strengthen collective self-reliance among the countries of South Asia;
- to contribute to mutual trust, understanding and appreciation of one another's problems;
- to promote active collaboration and mutual assistance in the economic, social, cultural, technical and scientific fields;
- to strengthen cooperation with other developing countries;
- to strengthen cooperation among themselves in international forums on matters of common interest; and
- to cooperate with international and regional organisations with similar aims and purposes.

The Declaration on South Asian Regional Cooperation was adopted by the Foreign Ministers in 1983 in New Delhi. During the meeting, the Ministers also launched the Integrated Programme of Action (IPA) in nine agreed areas, namely, Agriculture; Rural Development; Telecommunications; Meteorology; Health and Population Activities; Transport; Postal Services; Science and Technology; and Sports, Arts and Culture. The South Asian Association for Regional Cooperation (SAARC) was established when its Charter was formally adopted on 8 December 1985 by the Heads of State or Government of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Afghanistan was added to the regional grouping at the behest of India on 13 November 2005, and became a member on 3 April 2007. With the addition of Afghanistan, the total number of member states were raised to eight (8). In April 2006, the United States of America and South Korea made formal requests to be granted observer status. The European Union has also indicated interest in being given observer status, and made a formal request for the same to the SAARC Council of Ministers meeting in July 2006. On 2 August 2006 the foreign ministers of the SAARC countries agreed in principle to

grant observer status to the US, South Korea and the European Union. On 4 March 2007, Iran requested observer status. Followed shortly by the entrance of Mauritius.

Secretariat

The SAARC Secretariat was established in Kathmandu on 16 January 1987 and was inaugurated by Late King Birendra Bir Bikram Shah of Nepal.

It is headed by a Secretary General appointed by the Council of Ministers from Member Countries in alphabetical order for a three-year term. He is assisted by the Professional and the General Services Staff, and also an appropriate number of functional units called Divisions assigned to Directors on deputation from Member States. The Secretariat coordinates and monitors implementation of activities, prepares for and services meetings, and serves as a channel of communication between the Association and its Member States as well as other regional organizations.

The Memorandum of Understanding on the establishment of the Secretariat which was signed by Foreign Ministers of member countries on 17 November 1986 at Bangalore, India contains various clauses concerning the role, structure and administration of the SAARC Secretariat as well as the powers of the Secretary-General. In several recent meetings the heads of state or government of member states of SAARC have taken some important decisions and bold initiatives to strengthen the organisation and to widen and deepen regional co-operation. The SAARC Secretariat and Member States observe 8 December as the SAARC Charter Day.

Criticism

Not enough is being done to for rapid economic integration of the region. Apart from the fact that the recently approved South Asian University and the creation of new rail lines linking the region, people to people contacts and connectivity of region needs to be strengthened.

Political Issues

SAARC has intentionally laid more stress on "core issues" mentioned above rather than more decisive political issues like the

Kashmir dispute and the Sri Lankan civil war. However, political dialogue is often conducted on the margins of SAARC meetings. SAARC has also refrained itself from interfering in the internal matters of its member states. During the 12th and 13th SAARC summits, extreme emphasis was laid upon greater cooperation between the SAARC members to fight terrorism.

Free Trade Agreement

Over the years, the SAARC members have expressed their unwillingness on signing a free trade agreement. Though India has several trade pacts with Maldives, Nepal, Bhutan and Sri Lanka, similar trade agreements with Pakistan and Bangladesh have been stalled due to political and economic concerns on both sides. India has been constructing a barrier across its borders with Bangladesh and Pakistan. In 1993, SAARC countries signed an agreement to gradually lower tariffs within the region, in Dhaka. Eleven years later, at the 12th SAARC Summit at Islamabad, SAARC countries devised the South Asia Free Trade Agreement which created a framework for the establishment of a free trade area covering 1.4 billion people. This agreement went into force on January 1, 2006. Under this agreement, SAARC members will bring their duties down to 20 per cent by 2007.

DHAKA 2005 SUMMIT

The summit accorded observer status to People's Republic of China, Japan, South Korea and United States of America. The nations also agreed to organize development funds under a single financial institution with a permanent secretariat, that would cover all SAARC programs and also ranging from social, to infrastructure, to economic ones.

Membership

Current members (alphabetically):

- Afghanistan
- Bangladesh
- Bhutan
- India
- Maldives

- Nepal
- Pakistan
- Sri Lanka.

Observers:

- Australia
- China
- European Union
- Iran
- Japan
- Mauritius
- Myanmar (Burma)
- South Korea
- United States.

Future membership:

- The People's Republic of China has shown its interest in joining SAARC. While Pakistan and Bangladesh support China's candidature, India is against the prospect of Chinese membership. China's entry in to SAARC will likely balance India's overbearing presence there. However, during the 2005 Dhaka summit, India agreed on granting observer status to the PRC along with Japan. During the 14th summit, Nepal along with Pakistan and Bangladesh, announced their support for the membership of China. China seeks greater involvement in SAARC, however, finds it too early to apply for full membership.
- Indonesia intends to become an observer as well, and is supported by Sri Lanka.
- Iran, a state with borders to two SAARC members, has traditionally enjoyed strong cultural, economic and political relationships with Afghanistan and Pakistan and has expressed its desire to become a member of the South Asian organization. On 22 February 2005, the Foreign Minister of Iran, Kamal Kharrazi, indicated Iran's interest in joining SAARC by saying that his country could provide the region with "East-West connectivity". On 3 March 2007, Iran asked to join the SAARC as an observer. SAARC Secretary-General Lyonpo Chenkyab Dorji responded by

saying that Iran's request for observer status would be taken up during a meeting of ministers of foreign affairs of SAARC member countries in the 3 April summit in New Delhi.

- Russia intends to become an observer as well, and is supported by India.
- Myanmar has expressed an interest in joining as a full member. If done so, Myanmar will become the ninth member in the group. India is currently backing Myanmar. Myanmar's military regime officially applied for full SAARC membership in May 2008. However, the application is still being considered and the government is currently restricted to observer status.
- South Africa has participated in meetings.

SAARC Preferential Trading Arrangement

The Agreement on SAARC Preferential Trading Arrangement (SAPTA) was signed on 11 April 1993 and entered into force on 7 December 1995, with the desire of the Member States of SAARC (India, Pakistan, Nepal, Sri Lanka, Bangladesh, Bhutan and the Maldives) to promote and sustain mutual trade and economic cooperation within the SAARC region through the exchange of concessions. The establishment of an Inter-Governmental Group (IGG) to formulate an agreement to establish a SAPTA by 1997 was approved in the *Sixth Summit of SAARC* held in Colombo in December 1991.

The basic principles underlying SAPTA are:

1. overall reciprocity and mutuality of advantages so as to benefit equitably all Contracting States, taking into account their respective level of economic and industrial development, the pattern of their external trade, and trade and tariff policies and systems;
2. negotiation of *tariff reform* step by step, improved and extended in successive stages through periodic reviews;
3. recognition of the special needs of the Least Developed Contracting States and agreement on *concrete preferential measures* in their favour;

4. inclusion of all products, manufactures and commodities in their raw, semi-processed and processed forms.

So far, four rounds of trade negotiations have been concluded under SAPTA covering over 5000 commodities.

TOWARDS REGIONAL COOPERATION

The efforts at exploring avenues of cooperation within South Asia on amultilateral basis and institutionalization of these preliminary attempts in South Asian Association for Regional Cooperation (SAARC) have been a manifestation of the ingrained eling atqong the political elite and decision makers in the Indian subcontinent that there is an inherent geographic, cultural unity, similar climate conditions as well as economic complementaries that needs institutional expression. The creation of SAARC in December 1985 has been a tangible manifestation of seven member nations determined effort to cooperate regionally to work together towards finding solutions towards their common problems in a spirit of friendship, trust and mutual understanding. The goal to create an order based on mutual respect, equity, shared benefits will help to promote the welfare and prosperity of their people and will improve their quality of life.

Since the nation states are themselves in the process of being formed in the region the concept of a supra-national region seems novel and contradictory to the immediate task of nation building. Nation-states are absolutely central and crucial for any project in South Asia. If regional economic cooperation has failed to take off, it is because most nation-states themselves are major failures.

The success of SAARC will ultimately depend on the wisdom and prudence of member states to take advantage of the goodwill generated by the enterprise and resolution of political differences. With the pace of democratization gaining momentum in the region, along with the emerging world order the journey begins towards achieving the goal "United we stand and divided we fall". This in essence is the challenge before SAARC.

Let us Sum Up

South Asia is beset with numerous problems- the traditional problems arising out of proximity of member countries in the

region, the predominance and centrality of India in the region and the political dynamics in the states. With the nuclearization of two important and antagonistic members of the region, namely India and Pakistan, the region has emerged one of the major flash points for nuclear conflict.

The SAARC, the first manifestation of regional cooperation in the region is trying to shatter sickles of mutual distrust and strengthen cooperation between the countries of the region. However, political problem is proving to be major hurdle. As we observed, the political problem has its roots in the South Asia nation-state. The drawing of political map on a uniform cultural landmass and economic space has not only resulted in interstate conflicts but has eroded the foundation of regional thinking. The division into nation-states is strong.

Some commentators have argued that it would be appropriate to define a new concept of security, which encompasses not only military security but also broader issues such as poverty reduction, environment conservation, energy and food security. It is argued that such an approach will: (a) contribute to a shift from state-centric security perception to individual security, and (b) will encourage countries to jointly address the issue of "Common Enemy". While the Indo-Pak cooperation in sharing lndus waters strengthens such arguments and institutional mechanism in the form of SAARC exists, the initiatives on meeting the challenges of human development and security are yet to concretise.

It would be, however, erroneous to conclude from this unfortunate past experience that there cannot be any strategic harmony in South Asia. The region is a natural strategic unit surrounded by the Himalayas in the north and the Indian Ocean in the south. Moreover, countries in the region often coordinated their approaches to the questions of disarmament, including chemical and nuclear weapons, at the United Nations or elsewhere. In the 1970s, they have displayed a strong consensus on some, of the key aspects of the proposal on Indian Ocean as a Zone of Peace. Furthermore, there are areas of bilateral security arrangements, understandings and concrete cooperation among the South Asian countries, notwithstanding occasional irritants and apprehensions in implementation. The only serious dilemma

in South Asia's strategic harmony is that of India-Pakistan conflict, which seems to be erupting into more serious dimensions when the army becomes politically assertive in Pakistan.

India's Projection of Naval Power a Necessary One

India's official announcement of building its first aircraft carrier signals a new turning point in its modern history - a possible dominance of the Indian Ocean for the first time as well as a transformation of India towards becoming a naval power.

Two questions arise – is the rise of India as a regional naval power a benign one? And more importantly, how will other regional players view this latest development? Pakistan, India's long standing rival, will no doubt look upon the acquisition of India's second carrier as a heightening of India's offensive powers. This is in addition to F-16 and F-18 fighter sales made by the USA to India in March 2005. In the past, Pakistani southern sea ports have been vulnerable to naval blockade by the Indian Navy. China will no doubt see India as embarking on a policy seeking to rival its own desire to also establish a naval presence in the Asia-Pacific and South East Asian (SEA) waters.

Pakistan and China's concerns are not without merit. The official announcement of the USA to withdraw its military forces in August last year, implied a lessening of the US sphere of naval influence in the Pacific region. India's move to improve its naval capabilities may not necessarily be a bad thing. Professor Amitav Archarya of the Institute of Defence and Strategic Studies (IDSS), Singapore, argued optimistically that India and China are behaving mostly as "status quo" powers. That may indeed be so. Yet the vacuum that will be left behind in the wake of the withdrawal of the US military presence from the Korean peninsula leaves many opportunities to regional players strong and enterprising enough to seize them, thereby filling in the shoes of the US's prior security role in Asia. Tactically, the USA has also requested that India increasingly shoulder the responsibility of protecting the sea lanes in Indian Ocean. India is already protecting high value US cargo going through these lanes.

Already, Indian naval vessels help to patrol the Malacca Strait in combating piracy and providing maritime security. Their

presence, as a gesture of external aid rendered to SEA states, can be a paving stone for improvement of regional international relations. As a larger regional player, India has the necessary naval strength as well to make the burden of patrolling the Malacca Strait an easier one for the other three partners to bear in the four-power strait patrol arrangement.

In a more subtle role as well, India can also quietly act as a balance of power and a check to increasing Chinese influence in the Asia-Pacific and Indian Ocean regions. Already, China has an agreement to be allowed to use a naval base in Myanmar near the Nicobar Islands. This may be interpreted as a long range policy of regional hegemonic ambitions harboured by China in the seas south of the Asian continent. In any case, it is a fact that hegemonic ambitions or not, securing such a base adds to the extension of Chinese naval capabilities. Therefore, it is logical that India, too, takes prudent steps in countering such a possible development. Nevertheless, so as to give public indications that the building of an aircraft carrier does not signify aggressive intentions, it is necessary that India acts prudently, especially in the territorial waters of South East Asian states.

India's projection of naval power into the Indian Ocean and beyond is a logical and necessary move, as befitting its increasing international outlook. With the modern onset of globalization, a large populous nation such as India cannot afford to stay as an isolated nation on the delusion of self sufficiency. And in order to take on the active challenge of involvement in regional and international affairs, it is necessary for India to look towards expanding outwards. India's Look East Policy is designed for economic engagement with SEA states. So too, must there be increased co-ordination and co-operation between the latter's navies and the Indian Navy. The addition of this aircraft carrier to the Indian Navy could not have been more timely.

SPECIAL DIPLOMACY WITH SAARC COUNTRIES

India has enhanced its engagement with all SAARC countries both bilaterally and through the South Asian Association for Regional Cooperation (SAARC). It has increased efforts for

enhancing trade and connectivity links through land, air and sea for accelerating regional integration and greater people-to-people contacts. India continues its efforts to build peaceful cooperative ties with Pakistan to address the outstanding issues through peaceful bilateral dialogue.

A sub-regional Motor Vehicles Agreement (MVA) was signed between Bangladesh, Bhutan, India and Nepal (BBIN) on June 15, 2015 in Thimphu, Bhutan for the regulation of passenger, personal and cargo vehicular traffic between the four countries. This BBIN MVA will ease cross-border movement of goods, vehicles and people, thereby helping to expand people-to-people contact, trade and economic exchanges between them.

South Asia is among the least integrated regions of the world with low levels of intra-regional trade. India is taking a lead role in all SAARC mechanisms working towards removal of trade barriers, tariff liberalization and liberalization of trade in services to improve trade among member nations of SAARC.

SAARC: BEHIND THE FORMATION AND BASIC CHARACTERISTICS

Today the world is at a level of diplomatic interaction which we never experienced before in the history of mankind. With the increasing number of states since the Second World War, world diplomacy has undergone through many phases of evolution. The diplomatic activities increased as the international organizations increased, but along with these developments, many scholars do argue that this process of globalization is indeed taking place much more under regionalism. Today, almost all the parts of the world is experiencing greater regional ties. EU as the pioneer of the regionalism, ASEAN, AU, NAFTA,GCC are few names among the list of regional organization. Though their aim and activities does vary in great manner, but they do operate on the basis of regionalism.

Surprisingly world's most populated region South Asia seemed to lag behind in this trend of regionalism. Though the countries situated in the region shares quite common history and culture with similar religious and lingual diversity, still South Asia was known as "the region without regionalism" till the recent past.

One out of many reason behind this lack of regionalism was the history of rivalry, religious and ethnic tension, experience of riots and wide spread poverty, with regular claim of conspiracy of covert violation of sovereignty by neighbor's. Also the region was not clearly identified till the formation of South Asian Association for Regional Cooperation. It was only after the creation of SAARC, one can name any of its member states as South Asian state, but still the blurred lines are not so clear. However, despite the lack of a very clear identification, today one can bring proof of the existence of South Asia by naming SAARC's member states which are, Afghanistan-Bangladesh-Bhutan-India-Maldives- Nepal-Pakistan and Sri Lanka. (SAARC Charter, 1985)

Although SAARC has not been perceived as a particularly effective regional institution, it has generated a seemingly endless supply of initiatives, summit declarations, communiqués, and expert committee reports (Saez, 2011). In the recent years, SAARC even expanded its area, as Afghanistan joined in 2005. But, even today South Asia couldn't overcome its trouble of identity. Scholarly work on this SAARC is extremely limited as many perceive it as a failed association. One has to literally struggle to find some comprehensive piece of writings on its formation.

In a descriptive method of study I will inquire the background of its creation. What forced the founder of the SAARC, former Bangladeshi Late President Ziaur Rahman to initiate the process of forming this regional organization and how his vision came into being.

Initial Phase

Former President of Bangladesh, Zia ur Rahman was the initiator of the idea to create a regional cooperation among the neighboring South Asian states. "The first concrete proposal for establishing a framework for regional cooperation in South Asia was made by the late president of Bangladesh, Ziaur Rahman, on May 2, 1980 (Dash, Summer 1996)". President Ziaur Rahman wrote a letter to the other governments in the region in May 1980. The letter began with the argument that the 'current situation in South Asia and its immediate vicinity seems to call for close consultations and exchange of views and ideas'. The second paragraph of the letter clarified that 'Recent events and

developments in and around South Asia and the Middle East represent a considerable threat to global peace and security. The situation in Afghanistan continues to undermine the security of the countries of the region…. Under these circumstances we believe there is an urgent need for cooperation among the countries of this area for preserving peace and stabiltiy' (Ahsan, 1992)". Prior to this proposal, he was expressing the idea of a regional organization for at least 3 years, during his visit to India in December 1977, Ziaur Rahman discussed the issue of regional cooperation with the new Indian prime minister, Morarji Desai (Dash, Summer 1996). At the same time, at the inaugural speech to the Colombo Plan Consultative Committee, which met in Kathmandu in December 1977, King Birendra of Nepal gave a call for close regional cooperation among the South Asian countries in sharing river waters. According to Kishor Dash, in 1979 President Ziaur Rahman also discussed the idea of creating a South Asian regional cooperation organization during the Commonwealth summit in Lusaka, Zambia, and at the summit of the Non-Aligned Movement held in Havana, Cuba (Saez, 2011).

Vision and other's reception:

Reason behind the Bangladeshi initiative: Dash stated Several factors seemed to have influenced President Ziaur Rahman's thinking about establishing a regional organization in South Asia during 1975-1979: "(1) change in the political leadership in the South Asian countries and demonstration of accommodative diplomacy by the new leaders; (2) Ziaur Rahman's need for Indian support to legitimize his coup d'etat regime; (3) an acute balance of payment crisis of almost all the South Asian countries, which was further aggravated by the second oil crisis in 1979; (4) failure of the North-South dialogues, and increasing protectionism by the developed countries; (5) publication of an extremely useful background report by the Committee on Studies for Cooperation in Development in South Asia (CSCD), identifying many feasible areas of cooperation; (6) assurance of economic assistance for multilateral cooperative projects on sharing water resources of Ganga and Brahmaputra by United States President Jimmy Carter and British Prime Minister James Callaghan during their visit to India, Pakistan and Bangladesh in January 1978; and (7) the Soviet

military intervention in Afghanistan in late December 1979 and the resulting rapid deterioration of the South Asian security situation.(5) During this critical period, President Ziaur Rahman's initiative for establishing a regional organization, which would permit the leaders of the South Asian countries an opportunity to improve their understanding of one another's problems and to deal with conflicts before they turn into crisis, became much more appealing. (Dash, Summer 1996)".

Indian reception: India viewed the initiative with skeptical eyes. India's main concern was the proposal's reference to the security matters in South Asia. Indian policy makers also feared that Ziaur Rahman's proposal for a regional organization might provide an opportunity for the small neighbours to regionalize all bilateral issues and to join with each other to "gang up" against India. (Dash, Summer 1996)

Pakistani reception: Pakistan viewed the proposal with a similar manner as India did, but their concern was different. Pakistan assumed that it might be an Indian strategy to organize the other South Asian countries against Pakistan and ensure a regional market for Indian products, thereby consolidating and further strengthening India's economic dominance in the region. (Dash, Summer 1996)

Sri Lankan reception: Bangladesh proposal was promptly endorsed by Sri Lanka. the Bangladesh president seemed to have given a concrete shape to the proposal after his visit to Sri Lanka and discussion with the Sri Lankan president, J. R. Jayawardene, in November 1979. (Dash, Summer 1996)

Nepali reception: Bangladesh proposal was promptly endorsed by Nepal, even In the inaugural speech to the Colombo Plan Consultative Committee, which met in Kathmandu in December 1977, King Birendra of Nepal gave a call for close regional cooperation among the South Asian countries in sharing river waters. The king's call was welcomed by President Ziaur Rahman during the former's visit to Bangladesh in January 1978. (Dash, Summer 1996)

Bhutanese reception: The proposal of creating a regional organization was promptly endorsed by Bhutan, it is a small state with low foreign policy aggregation, but were always willing to

act to create regional peace, they also held meeting of foreign ministers at capital Thimpu in 1985.

Maldives reception: Bangladesh proposal was promptly endorsed by Maldives, as another small state and had environmental threat, Maldives was also willing to act for regional bond. They held meetings of foreign ministers at capital Male in 1984.

Indian and Pakistani skepticism raised an early threat in front of SAARC's creation. Two countries fought 3 major wars between 1947 till the moment of this proposal, and both were the biggest and powerful states of the region. President Ziaur Rahman examined the situation and wasn't willing to let his ambition to fade away, so he let the discussion among foreign ministers of the south asian states to find out a working method, after a series of quiet diplomatic consultations between the South Asian foreign ministers at the U.N. headquarters in New York from August to September 1980, it was agreed that Bangladesh would prepare the draft of a working paper for discussion among the foreign secretaries of the South Asian countries. The new Bangladesh draft paper, sensitive to India's and Pakistan's concern, dropped all references to security matters and suggested only nonpolitical and noncontroversial areas for cooperation. (Dash, Summer 1996) This was particularly a crucial step. Dropping out security matters and choosing only non political and non controversial matters allowed the creation of the organization, but as we can see the real potentiality of the organization would be over shadowed by those dropped references.

The outcome: After the long periods of talks and changes in the positions of heads of states, President Ziaur Rahman's initiative finally came into being, though quite far from the original vision of the late President, but in deed this was the first regional organization in the history of this region. The association solely focused on the peace and confidence building measures among the population of its member states.

Preparatory organization work

Since the primary level of exchange of ideas among heads of states and agreement to create an regional organization in the

South Asia has done, pre phase of the creation of SAARC begun at the secretariat and ministerial level. Where they were working on the details and gave the shape of regional cooperation through structured development. Between 1980 and 1983, four meetings at the foreign secretary levels (April 21-23, 1981, Colombo; November 2-4, 1981, Kathmandu; August 7-8, 1982, Islamabad; March 28-30, 1983, Dhaka) took place to establish the principles of organization and identify areas for cooperation. After three years of preparatory discussion at the official level, the focus of discussion shifted to the political level in 1983. The first South Asian foreign ministers' conference was held in New Delhi from August 1-3, 1983, where the Integrated Program of Action (IPA) on mutually agreed areas of cooperation (i.e., agriculture, rural development, telecommunications, meteorology, health and population control, transport, sports, arts and culture, postal services and scientific and technical cooperation) was launched. The foreign ministers of this conference also adopted a Declaration on Regional Cooperation, formally beginning an organization known as the South Asian Regional Cooperation (SARC). Following the New Delhi meeting, three more meetings of the foreign ministers were held at Male (July 10-11, 1984), Thimpu (May 13-14, 1985), and Dhaka (December 5, 1985) to finalize details and determine a date and place for the first meeting of South Asian heads of state.

At the Dhaka foreign ministers' meeting, a decision was taken to change the name of the organization from South Asian Regional Cooperation (SARC) to South Asian Association for Regional Cooperation (SAARC). The change in the acronym was based on the thinking that while SARC refers to the process of South Asian Regional Cooperation, SAARC marks the establishment of an association (organization) to promote and develop such cooperation. Finally, the first summit meeting of the heads of state or government of the South Asian countries was held at Dhaka from December 7-8, 1985 (Hussain, 1999). The idea of working on a bottom-up approach, I mean the decision to work on the details at secretariat and ministerial level before holding an summit meeting and declaring creation of a organization proven to be a crucial and fruitful decision because in the mean time President Ziaur Rahman, the initiator was assassinated in Bangladesh. Keeping the nature of South Asian politics and level of trust

among each other, any top to bottom approach could be seriously faced with obstacle.

The Charter

We will analyze the charter of SAARC to see how successfully it met or stayed distant from the aim of President Ziaur Rahman. SAARC charter began with a Declaration and is divided into 10 articles, which contains declaration of Objectives and Principles in article 1 and 2. Article 3 to 8 are describing association's organizational structure. And, article 9 and 10 announcing working methods. (SAARC Charter, 1985)

The Declaration:

"We, the Heads of State or Government of BANGLADESH, BHUTAN, INDIA, MALDIVES, NEPAL, PAKISTAN and SRI LANKA;

1. Desirous of promoting peace, stability, amity and progress in the region through strict adherence to the principles of the UNITED NATIONS CHARTER and NON-ALIGNMENT, particularly respect for the principles of sovereign equality, territorial integrity, national independence, non-use of force and non-interference in the internal affairs of other States and peaceful settlement of all disputes;
2. Conscious that in an increasingly interdependent world, the objectives of peace, freedom, social justice and economic prosperity are best achieved in the SOUTH ASIAN region by fostering mutual understanding, good neighbourly relations and meaningful cooperation among the Member States which are bound by ties of history and culture;
3. Aware of the common problems, interests and aspirations of the peoples of SOUTH ASIA and the need for joint action and enhanced cooperation within their respective political and economic systems and cultural traditions;
4. Convinced that regional cooperation among the countries of SOUTH ASIA is mutually beneficial, desirable and necessary for promoting the welfare and improving the quality of life of the peoples of the region;

5. Convinced further that economic, social and technical cooperation among the countries of SOUTH ASIA would contribute significantly to national and collective self-reliance;
6. Recognising that increased cooperation, contacts and exchanges among the countries of the region will contribute to the promotion of friendship and understanding among their peoples;
7. Recalling the DECLARATION signed by their Foreign Ministers in NEW DELHI on August 2, 1983 and noting the progress achieved in regional cooperation;
8. Reaffirming their determination to promote such cooperation within an institutional framework;

DO HEREBY AGREE to establish an organisation to be known as SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION hereinafter referred to as the ASSOCIATION, with the following objectives, principles, institutional and financial arrangements:" (SAARC Charter, 1985)

The declaration has opened three fields of cooperation namely Economy, Social and Technical. Cooperation in these fields among the South Asian countries could be viewed positively or negatively, both. Optimism derives from the fact that, since the colonial era, there were no formal cooperation or exchange among these countries with certain aim to develop their people. Although almost all the member states holds similar conditions in social and economic sectors, but aim of exchange of technical knowledge could really be helpful for the smaller states. Pessimism derives from the fact that the declaration completely overlooked cooperation in the region's Security and Political sectors, which were fundamental aim of Ziaur Rahman. Also, these three sectors of cooperation would be beneficial only if the political will were present in the member states, but the declaration strictly restrained from promising any development in the political sector indeed provision of Political matters were dropped out at the beginning phase of discussion in the pre-establishment level, but even to cooperate successfully in these three sectors also requires political will because the nature and structure of the association. In the following pages we will see why political will was so important.

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