

## Climate Change to trigger Bangladeshi exodus in Assam: A Critical Review on the Climate Induce Migration and Environment and Demographic situation of Assam, India

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### Abstract:

*In an admission that is likely to have serious ramifications for the infiltration-hit North Eastern States, Bangladesh Prime Minister Sheikh Hasina warned of 30 million Bangladeshis becoming 'climate migrants' due to global warming. Here the question of migration is directly related to Assam to a large extent. Assam is part of a region of Northeast India known as the "Seven Sister States," contiguous states that share at least one border with another nation and have correspondingly diverse cultures and ethnicities. Climate changes in Bangladesh, with its low-lying geography, dense population, and large subsistence agriculture base, create push factors for migration into Assam. Climate change alters habitats so that the carrying capacity of lands can no longer maintain the indigenous population. Bangladesh is currently experiencing this change, forcing locals to migrate to resource-rich locations. Unfortunately, there are few unsettled locales left on earth, so these migrants inevitably come into contact with local populations. Through this paper an attempt will be made to look into the consequence of global warming and its impact on socio-economic situation on Assam. Moreover, attempt will also be made on the impact on environment, its biodiversity, ethnic tension and demographic transition in the region.*

**Key words:** Climatic change; global warming; Bangladesh; migration; socio-economic; biodiversity; Assam

## **Introduction**

Mass migration due to climate change may have negative consequences including escalating humanitarian crisis, rapid urbanization and associated slum growth and stalled development. This may require national governments and international organizations to plan for the relocation and resettlement and protection of affected population inside their country as well as immigration from other countries. This paper brings together the important issue of climate change and its impacts on population movement from Bangladesh to Assam, India.

Bangladesh, the world's most densely populated country, is also environmentally one of the most vulnerable regions due to its geographical and spatial location (Ministry of Environment and Forests 2002). With a population of over 133 million people in a small area and a population density of more than 1,209 persons per sq.km, and 75% of the population lives in rural areas, Bangladesh is a very densely populated country (World Bank, 2002). Higher population density increases vulnerability to climate change because more people are exposed to risk and opportunities for migration within a country are limited. The country is composed largely of low lying areas lands less than sea-level above sea level. About 80% land is floodplain. It is also frequently visited by extreme climatic events, causing damage to life property and economy.

Bangladesh is a disaster-prone country. Almost every year, the country experiences disasters of one kind or another—such as tropical cyclones, storm surges, coastal erosion, floods, and droughts—causing heavy loss of life and property and jeopardizing the development activities. Bangladesh, one the

least developed nations of the world, may also be one of the most vulnerable to climate change. The widespread flood in 1988 which submerged about two-thirds of the country, and the storm surge of April 1991 which resulted in the deaths of nearly 140,000 coastal inhabitants, are recent reminders of the degree to which the people of Bangladesh are subject to present-day variations in climate. The possibility of changes in climate and sea-level rise must be considered seriously in the context of the future development of Bangladesh.

Illegal migration from Bangladesh into Assam should be viewed against the backdrop of past history, present realities and future designs. Migration into Assam has been taking place from the dawn of history. However, after the British annexed Assam, large scale population movement from the South (Bengal, East Pakistan and now Bangladesh) has been an ongoing phenomenon for over a century. Initially, this movement was for economic reasons only but with the approach of Independence, it started developing both communal and political overtones. After Independence, it acquired an international dimension and it now poses a grave threat to our national security. Illegal migration from Assam has been taking place primarily for economic reasons. Bangladesh is the world's most densely populated country with a population density of 969 per square kilometre. The growth rate of population in that country is 2.2 per cent and its population is growing at the rate of 2.8 million per year. Each year nearly one third of Bangladesh gets inundated by floods, displacing 19 million people. 70 million people constituting 60 per cent of the population live below the poverty line. The per capita income in Bangladesh is 170 dollars per year, which is much lower than the per capita income in India. The border between India and Bangladesh is very porous. In these circumstances, the continued large scale population movement from Bangladesh to India is inevitable, unless effective measures are taken to counter it.

## **Impact of Climatic Change and Bangladesh:**

Climate change and sea level rise are now a reality. The recent finding of the fourth assessment report of the world scientific community, represented by the intergovernmental panel on climate change (IPCC), demonstrates that human activities are responsible for global warming and global climate change and sea level rise (UNDP, 2007).

Various human activities are making the world hot to hotter where the ultimate result is global warming, i.e. climate change. Anthropogenic causes responsible for global warming are expected to continue to contribute to an increase in global-mean sea level rise during this century and beyond (Church et al., 2001, IPCC; 2007).

It is commonly accepted that the global average surface air temperatures have risen by 0.74°C (0.56 °C to 0.92 °C) over the last 100 year from 1906 to 2005. Eleven of last twelve years(1995 –2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850) (IPCC, 2007).Rising temperature in the atmosphere causes sea level rise and affects low lying coastal area sand deltas of the world. In 1990, Intergovernmental Panel on Climate Change (IPCC) estimates that with a business-as-usual scenario of greenhouse gas emission, the world would be 3.3°C warmer by the end of the next century, with a range of uncertainty of 2.2° to 4.9°C (Warrick et al., 1993).

The major environmental effects of sea level rise include the loss of habitats and biodiversity due to inundation, shoreline retreat, increased coastal flooding, landslide and erosion during storm surges and rainstorms, and the intrusion of salt water into aquifers, estuaries, and wetlands (Titus et al., 1991). Sea level rise will increase the vulnerability of coastal populations and ecosystems via permanent inundation of low-lying regions, inland extension of episodic flooding, increased

beach erosion and salinity intrusion of aquifers (Mclean et al.,2001).

Bangladesh is a disaster prone country. Bangladesh's geographical vulnerability lies in the fact that it is an exceedingly flat, low lying, alluvial plain covered by over 230 rivers and rivulets with approximately 710 kilometers of exposed coastline along the Bay of Bengal. As a result of its geography, Bangladesh is frequently suffers from devastating floods, cyclones and storm surge, tornadoes, riverbank erosion and drought as well as constituting a very high-risk location for devastating seismic activity (Sarwar, 2005).

Ahmed and Alam (1999) reported that the average increase in temperature in Bangladesh would be 1.3°C and 2.6°C by the year 2030 and 2075 respectively with respect to the base year 1990. Two estimates of potential future SLR for Bangladesh are 0.30-1.5 m and 0.30-0.50 m for 2050 (DoE, 1993). Analysis of meteorological data from 1977 to 1998 clearly shows annual sea level rise at the rate of 7.88 mm, 6 mm and 4 mm respectively in Cox's Bazar, Chardanga at Hatiya and Hiron point in Sundarban (Shamsuddoha and Chowdhury, 2007).

Sea level rise has various impacts on Bangladesh. Its potential threats are coming even strongly in the future. Sea level rise will cause river bank erosion, salinity intrusion, flood, damage to infrastructures, crop failure, destruction of fisheries, loss of biodiversity etc. along this coast. World Bank (2000) projection showed 10 cm, 25 cm and 1 m rise in sea level by2020, 2050 and 2100 which will affect 2%, 4% and 17.5% of the total land mass respectively.

### **Climate change scenarios for Bangladesh**

There are various estimates of temperature rise in Bangladesh. Ahmed and Alam (1999) reported that the average increase in temperature in Bangladesh would be 1.3°C and 2.6°C by the

year 2030 and 2075 respectively with respect to the base year 1990. The seasonal variation of temperature will be more in winter 1.3°C than in summer 0.7°C for 2030 and 2.1°C for winter and 1.7°C for summer for 2075.

Using the 1961-1990 baseline data for Bangladesh it was shown that annual mean maximum temperature will increase by 0.40°C and 0.73°C by the years 2050 and 2100 respectively. The mean minimum temperature will correspondingly rise by 0.04°C and 0.08°C. But the mean annual temperature will increase by 0.22°C and 0.41°C respectively (Karmakar and Shrestha, 2000).

In 2030, precipitation will increase slightly in winter and moderately in summer. But, in 2075, evaporation would be much higher in winter. There would be more precipitation during the monsoon period and precipitation would decrease in winter. This means that increased rainfall would lead to more severe flood situation in summer, and low precipitation and higher temperature in winter will cause more drought like conditions in winter. On the other hand, in 2075, the change will be very pronounced in monsoon while there would not be any noticeable precipitation in winter (Ahmed and Alam, 1999). In a study, Karmakar and Shrestha (2000) predict that annual total rainfall over Bangladesh is likely to increase by 295.94 mm and 542.55 mm by 2050 and 2100 respectively. Global warming will increase the intensity of south-west monsoon (SWM) which will, in turn, bring about catastrophic ravages like erosion, land sides and floods and have far reaching consequences on agriculture, habitat, economy, etc.

**Climate change scenario used in Bangladesh National Adaptation Programme of Action (NAPA)**

Year	Temperature change (°C) Mean (standard deviation)			Precipitation change (°C) Mean (standard deviation)		
	Annual	Winter	Monsoon	Annual	Winter	Monsoon
2030	1.0	1.1	0.8	5	-2	6
2050	1.4	1.6	1.1	6	-5	8

2100	2.4	2.7	1.9	10	-10	12
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(source: NAPA: cited in UNDP, 2007)

## Sea level rise (SLR) scenarios for Bangladesh

Bangladesh is highly vulnerable to sea level rise, as it is a densely populated coastal country of smooth relief comprising broad and narrow ridges and depressions (Brammer et al., 1993).

Various scenarios have been predicted about SLR in Bangladesh. Two estimates of potential future SLR for Bangladesh are 0.30 to 1.5 m and 0.30 to 0.50 m for 2050 (DoE, 1993). Several factors such as non-uniform rise in temperature, accelerated rise in temperature, geological subsidence and sedimentation may influence this rate.

A study by Singh et al. (2000) shows that mean tidal level at Hiron Point (21°48' N, 89°28' E), Char Changa (22°08'N, 91°06'E) and Cox's Bazar (21°26'N, 91°59'E) is showing an increase of 4.0 mm yr<sup>-1</sup>, 6.0 mm yr<sup>-1</sup> and 7.8 mm yr<sup>-1</sup> respectively, which is much higher than the global rate. The higher rate has been attributed to subsidence. An increasing tendency in SLR from west to east along the coast has also been found.

Using tidal gauge records, researchers at the SAARC Meteorology Research Centre (SMRC) in Dhaka, Bangladesh found an increasing east-west trend of 4 mm to 7.8 mm year<sup>-1</sup> rise in sea level for the Sundarbans from 1977 to 1998 (Alam, 2003; SMRC, 2003), which is greater than the average global SLR estimate during the same period.

## Sea level rise (SLR) scenarios in Bangladesh and its possible impacts

Impact on	Projected		
	2020	2050	2100
Sea Level Rise	10cm	25 cm	1 m (high end estimate)
Land below	2%	4%	17.5%

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SLR			
Storm surge	-	Storms surge goes from 7.1 to 8.6 m with 0.3 m SLR	Storms surge goes from 7.4 to 9.1 m with 0.3 m SLR
Flooding	20% increase in inundation.	Increase flooding in Meghna and Ganga floodplain.	Both inundation area and flood intensity will increase tremendously.
Agriculture	Inundate 0.2 million metric tons of production; <1% of current total	0.3m SLR inundate 0.5 Mmt. Of production; 2% of current total.	Devastating flood may cause crop failure for any year.
Ecosystem	Inundates 15% of the Sundarbans.	Inundates 40% of the Sundarbans.	The entire Sundarbans would be lost.
Salinity	Increase	Increase	Increase

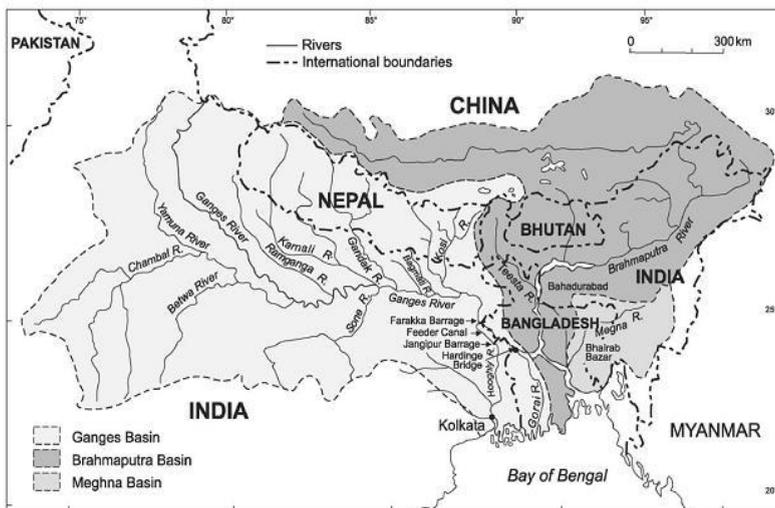
Source: World Bank, 2000.

In the Ganges-Brahmaputra-Meghna basin as a whole the increase in rainfall in the monsoon is predicted to be larger from around 4-8% by the 2020s and 9-10% by the 2050s, while winter rainfall is expected to reduce by 4-5% by 2050 (Tanner *et al*, 2007). The combined total catchments of these rivers from where rainfall drains into these rivers totals about 1.74 million km<sup>2</sup> and the amount of water coming through Bangladesh varies from less than 5000 cubic metres per second in the driest period (March-April) to 80,000-140,000 m<sup>3</sup>/s in late August to early September. Therefore higher rainfall outside of Bangladesh in the monsoon is likely to lead to more frequent and severe floods from swollen rivers, while less rain in the winter will mean less water in rivers in the dry season affecting river fed irrigation, industry, fisheries, travel by launch/ferries and increase salinity around the coast (Alam, 2004).

As only 7% the catchment of these major rivers lies inside Bangladesh, it is also vulnerable to extraction for

irrigation and hydroelectric schemes further upstream. The Ganges/Padma River is particularly affected and in India, barrages control all of the tributaries to the Ganges and divert roughly 60% of river flow to large scale irrigation. India also controls the flow of the Ganges into Bangladesh with over 30 upstream water diversions and the 5th largest dam in the world; the Farraka Barrage only 18 km from the Bangladeshi border was shown to reduce the average monthly flow by 86%. As Indi's „garland of rivers“ project aims to build many more dams as well as seek to interlink rivers and divert water from the Ganges and Brahmaputra Rivers to its drier southern states. Despite the 1996 Ganges Water Sharing Treaty with Bangladesh the amount of water entering the smaller, less powerful Bangladesh is expected to be further reduced due to climate change and accentuated by India's irrigation and electricity generation plans (Wong *et al*, 2007). This is likely to increase political tensions between the countries and may lead to conflict at least diplomatically.

### **Ganges/Padma, Brahmaputra/Jamuna and Megna Basins (Mirza, 2002).**



## **Impact of Migration on Assam:**

Illegal migration from Bangladesh into Assam has been a major political, economic, social and security issue for Assamese society, so much so that it evoked the non-violent, highly visible, Assam Agitation (1979-1985) spearheaded by the All Assam Students Union (AASU). That agitation resulted in the Assam Accord of 1985 which stated that anybody settled in Assam from Bangladesh after March 25, 1971 is not a citizen, but an illegal migrant. This provision of the Accord has not been implemented and has therefore failed to change the nature of Bangladeshi immigration into Assam, now termed as a “silent invasion” with the majority of the infiltration taking place through the Dhubri district in lower Assam bordering West Bengal, the districts of Cachar and Karimganj in Assam bordering Bangladesh and the 443 km Bangladesh-Meghalaya border. Assam shares a highly porous 262 kilometre border with Bangladesh with portions of it left completely unchecked due to the difficult nature of the terrain.

Unchecked global warming could cause unprecedented climate change induced migration to infiltration-hit northeastern Indian state, warns Bangladesh Prime Minister Sheikh Hasina. “Global assessments indicate that natural disasters in our region would increase in frequency and intensity,” the Bangladesh prime minister told the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) summit 2014.

The issue of illegal migration from Bangladesh has been plaguing northeastern India for long. In 2005, the Supreme Court of India, in a judgment referring to the then Governor Lt Gen (Retd) SK Sinha’s report, maintained that the impact of the “aggression,” represented by large-scale illegal migrants from Bangladesh, had made the life of the people of Assam “wholly insecure and the panic generated thereby had created fear-psychosis” among other states in the region.

Assam faces more direct effects of climate change as well. In September of last year, more than 1.4 million people were displaced by flooding along the Brahmaputra River in 18 of 27 districts of Assam, and 6 million were displaced in July. Unfortunately, “the frequency and extent of these floods is set to increase,” write the authors. Changing rainfall patterns also mean more erosion, creating the risk of deadly landslides like those that struck Western India earlier this summer, and unexpected droughts.

An additional population dynamic at work in Assam is urbanization. Rapid, unplanned urbanization puts pressure on water and other resources. This rural-to-urban movement can be temporary or permanent, depending on the severity of push factors, further complicating Assam’s ability to plan for infrastructure challenges.

To know the demographical contours of what has been called the melting pot of Assam, one has to go at least to the colonial times, and the impact of the politics of those time on the present political and demographic scenario in Assam. Migration has always been a reality in Assam. Throughout history people from various places have migrated to Assam, and the melting pot of Assam has assimilated them since time immemorial. However, these migrations were during the time when the concept of nation-states and citizenship were not well-defined, and hence there was no definition of the legality and illegality of such migration. However, after 1947, when the British left India, we had our own policy of immigration, citizenship and voting rights. Hence, the legal definition of the word “foreigner” comes into effect from 1947.

Assam shares an international border with Bangladesh and has been plagued with the problem of illegal immigration by Bangladeshi Muslims for the past four decades. The Governor of Assam, in a secret communiqué to the Central Government in 2005, revealed that “upto 6000 Bangladeshis enter Assam every day.” According to conservative estimates,

India is host to around ten million illegal Bangladeshi immigrants. Assam itself is inhabited by around five million illegal immigrants. The magnitude of this influx can only be assessed from the fact that the period between 1971 and 1991 witnessed the growth of Muslim population in Assam by 77.42 per cent as compared to a Hindu growth of 41.89 per cent. The population explosion has subsequently stabilized but even then, the decadal growth of 1991-2001 at 29.3 per cent for Muslims remained abnormally high as compared to a Hindu growth at 14.9 per cent.

Dhubri, which shares a long riverine border with Bangladesh, is an example of how illegal infiltration into the State continues unabated. As per provisional census details for the period 2001-2011, the decadal population growth for Dhubri at 24.4 per cent was distinctly higher when compared to the population growth of Assam at 16.9 percent for the same period. With the Brahmaputra River providing convenient entry points, the district is being virtually overrun by Bangladeshi infiltrators.

### **Future impact of migration in Assam**

Reliable estimates of the number of illegal Bangladeshis living in Assam in the 1970s and 80s are not available. There seems to be a mystery about the number of Bangladeshi foreigners in Assam. A number of recent studies focus on different aspects by using robust statistical methods albeit with a host of assumptions. Nath et al. (2012) use the Leslie Matrix method<sup>19</sup> to estimate the number of undocumented or illegal migrants in Assam for the period from 1971 to 2001, and finds that there were 830,757 illegal migrants for the period 1971-1991 and 534,819 for the period 1991-2001; and thus estimate a total figure of 1,365,574 in 30 years from 1971 to 2001. The decadal trend seems to be increasing. A simple extrapolation of this

s estimated number at the rate of 2.15% (the natural rate of growth of population in Bangladesh in 2008) for 10 years to 2011 yields an approximate estimate of 1.7 million undocumented migrant population for the period of 40 years from 1971 to 2011. Of course, one has to estimate, though not done yet, and add the figure for the undocumented entry for the decade 2001-2011 to 1.7 million.

Political shortsightedness has resulted in a situation where most Indian cities are getting burdened with these illegal Bangladeshi immigrants. The immigrants who have started shifting to greener urban pastures, which offer greater economic opportunities. However, it is in Assam that the conflict between the Indians and illegal Bangladeshi Muslims is growing. Emotions have been running high ever since the migrants started obtaining squatters rights on the lands which they were initially employed to till.

With the demography being dramatically altered by their steady influx, illegal immigrants have started wielding enormous political power in Assam. Muslims have become the majority in 11 out of 27 districts in the State and the dominant factor in determining electoral fortunes in 54 out of 126 constituencies in the local Assembly. A stage has been reached where no party can expect to attain political dominance without support from the Bangladeshi Muslims. The large scale migration from Bangladesh has significantly altered demographics in India's northeastern states, leading to social, economic, and political tensions between tribals and Bangladeshi Muslim settlers. For instance, in Assam, Muslims make up approximately 33% of Assam's population, and 11 out of 27 districts in the state now contain Muslim majorities. Bodo leaders in Assam assert that Bangladeshi Muslims are using their growing power to impose their culture and religion in the area.

It is this conversion of the illegal migrants into a political force, which has made the indigenous population apprehensive of losing its identity and culture. This unfettered illegal migration has ominous implications for national security and socio-economic stability. Intelligence inputs indicate that the Inter Service Intelligence Agency (ISI) of Pakistan is utilizing these migrants as conduits to ferry in terrorists and arms into India. Counterfeit Indian currency with its origins in Bangladesh has flooded border areas, crippling the economy in these parts.

## **Conclusion and Policy Recommendations**

Climate change is likely to expose hundreds of millions of people to increasing environmental risks displacing a large number of people and forcing them to migrate. There is an emerging view that these people should be recognized as climate refugees by international laws and proper institutional arrangements should be made to address their problems.

The illegal Bangladeshi migrants issue tends to dominate the political, economic, social, and security discourses in Assam with residents of the state expressing concern of being taken over demographically by this silent invasion. The lack of data on migration adds to a sense of being 'under siege' by outsiders as no one is sure as to the number of migrants visibly infiltrating all walks of life in Assam. The issue has political resonance as there is a general understanding in Assam that most of the local political parties depend on the votes of these illegal migrants for their hold on power.

The social impact of Bangladeshi migrants on Assamese society is mostly to do with culture and lifestyles. The social fear is that the Assamese way of life will get subverted once the migrants dominate the state. A strong impact is also envisioned in the spheres of language and religion. Assam, being a Hindu majority state, fears that it will become Muslim-dominated due

to the influx of illegal migrants. This has also resulted in unnecessary tensions between Assamese Hindus and Assamese Muslims who have made Assam their home for centuries. Pegged at over 20 million in India these migrants – mostly Muslims from Bangladesh – have been permanently settling down in Assam which has impacted the state's demography reducing the ethnic people of Assam into a minority in many areas, declining land availability and employment and increasing the crime rate.

Issue of illegal immigration in northeast region is becoming a serious concern and it has been a herculean task due to lack of political consensus on the subject. The problem of immigration is far more complex in view of the ethnic ties that the migrants share with the native population. As a result, to campaign against immigrants on the other hand is not an easy task and it tends to divide people on communal lines. Almost 80 percent of Bangladesh's population lives in the rural areas, of which 53 percent are classified as poor by the World Bank. While the country's population is growing, producing a bigger labor force, the land base is shrinking resulting in decline in cultivated areas at a rate of 1 percent per year.

The country is facing serious issues with living space due to alarming population growth. As per 2011 estimates, the population density of Bangladesh is 964 per sq km, one of the highest in the world. This poverty stricken population illegally migrates to India to work as farm labor, industrial labor, construction workers etc. These migrant settlers constitute a majority in many parts of Assam bordering Bangladesh, reducing local tribes to a minority. For instance Dhubri, on the Indo-Bangladesh border and point of entry for Bangladeshis, has Bengali-speaking Muslims rising from 70.45 per cent in 1991 to 76 per cent according to the 2011 Census, in contrast to a marginal growth of the indigenous Assamese-speaking Muslims.

The Central Indian Government and State Government in Assam must take all necessary steps to fully rehabilitate the victims of the recent riots and ensure the safety of all communities in the state going forward.

India must protect the social, economic, and political rights of the vulnerable tribal population in Assam and comprehensively address the underlying issue of illegal immigration from Bangladesh. The Indian Government should encourage the Government of Bangladesh to implement strong measures to curtail the flow of illegal immigrants, militants, and drugs from its side of the Indo-Bangladesh border in order to prevent further destabilization of the region. While it is perhaps wise to refrain from overstating the negative implications of the impact of illegal Bangladeshi migration on Assam's overall health since every migrant is not necessarily bad, it is good to have a check on who is crossing the border, when he or she is crossing and for what purpose as that ensures better security against future crimes. This will also instill a sense of security in India's border populations who fear domination by a migrant population especially in matters related to politics.

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