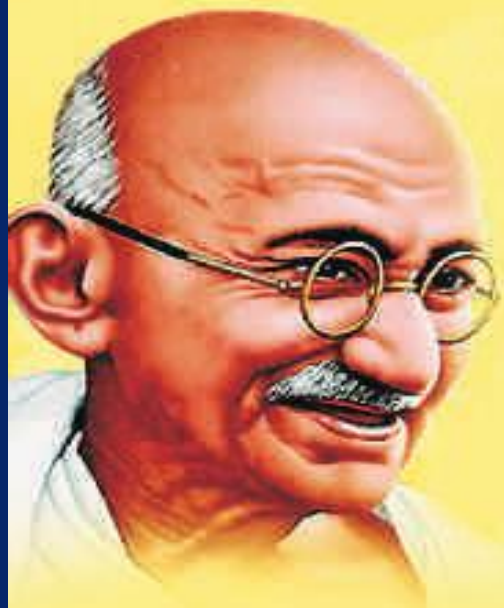
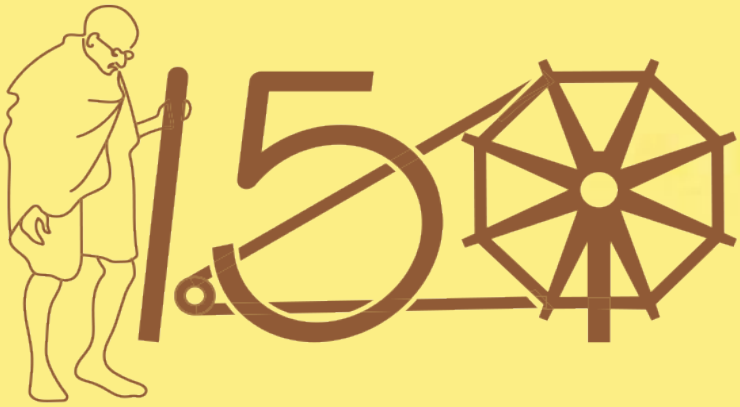
PERFECT 7 WEEKLY
CURRENT AFFAIRS

October: 2019/ Issue-01





FATHER OF THE NATION @ 150

Still Alive in Our Blood

- Issue of Prioritising a Language in Multi-lingual India
- One Nation, One Ration Card : Nation-wide Portability of Ration Card
- Implications of PM Modi's Speech in UNGA
- Quantum Supremacy : Next Era of Computational Evolution
- The Ocean and Cryosphere in a Changing Climate : IPCC Report
- North India River System : Imperative for Flood Management

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DHYEYA IAS : AN INTRODUCTION

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Vinay Kumar Singh
CEO and Founder
Dhyeya IAS

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Q H Khan
Managing Director
Dhyeya IAS

PERFECT 7 : AN INTRODUCTION

With immense pleasure and gratitude I want to inform you that the new version of 'Perfect-7', from the Dhyeya IAS, is coming with more information in a very attractive manner. Heartily congratulations to the editorial team. The 'Perfect-7' invites a wider readership in the Institute. The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of the teacher is to nurture the skills and talents of the students as a facilitator. This magazine is going to showcase the strength of our Institute. Let this be a forum to exhibit the potential of faculties, eminent writers, authors and students with their literary skills and innovative ideas.

I extend best wishes for the success of this endeavor.

Qurban Ali
Chief Editor
Dhyeya IAS
(Ex Editor- Rajya Sabha TV)

We have not only given the name 'Perfect 7' to our magazine, but also left no stone unturned to keep it 'near to perfect'. We all know that beginning of a task is most challenging as well as most important thing. So we met the same fate.

Publishing 'Perfect 7' provided us various challenges because from the beginning itself we kept our bar too high to ensure the quality. Right from the very first issue we had a daunting task to save aspirants from the 'overdose of information'. Focusing on civil services exams 'Perfect 7' embodies in itself rightful friend and guide in your preparation. This weapon is built to be precise yet comprehensive. It is not about bombardment of mindless facts rather an analysis of various facets of the issues, selected in a systematic manner. We adopted the 'Multi Filter' and 'Six Sigma' approach, in which a subject or an issue is selected after diligent discussion on various levels so that the questions in the examination could be covered with high probability.

Being a weekly magazine there is a constant challenge to provide qualitative study material in a time bound approach. It is our humble achievement that we feel proud to make delivered our promise of quality consistently without missing any issue since its inception.

The new 'avatar' of 'Perfect 7' is a result of your love and affection. We feel inspired to continue our efforts to deliver effective and valuable content in interesting manner. Our promise of quality has reached you in around 100 issues and more are yet to come.

Ashutosh Singh
Managing Editor
Dhyeya IAS

PREFACE

Dhyeya family feels honoured to present you a pandora box 'Perfect 7'. 'Perfect7' is an outstanding compilation of current affairs topics as per the new pattern of Civil Service examination (CSE). It presents weekly analysis of information and issues (national and international) in the form of articles, news analysis, brain boosters, PIB highlights and graphical information, which helps to understand and retain the information comprehensively. Hence,'Perfect 7' will build in-depth understanding of various issues in different facets.

'Perfect7' is our genuine effort to provide correct, concise and concrete information, which helps students to crack the civil service examination. This magazine is the result of the efforts of the eminent scholars and the experts from different fields.

'Perfect 7' is surely a force multiplier in your effort and plugs the loopholes in the preparation.

We believe in environment of continuous improvement and learning. Your constructive suggestions and comments are always welcome, which could guide us in further revision of this magazine.

Omveer Singh Chaudhary
Editor
Dhyeya IAS

Perfect 7

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Contents

SEVEN IMPORTANT ISSUES

1. FATHER OF THE NATION @ 150 : STILL ALIVE IN OUR BLOOD

Why in News?

Mahatma Gandhi's birthday, October 2, is not only commemorated in India as Gandhi Jayanti, a national holiday, but is celebrated worldwide as the International Day of Nonviolence. This year, government of India has celebrated 150th anniversary and released commemorative Rs. 150 coin.

Introduction

It has been seventy years since Mahatma Gandhi departed from our midst. But his life and soul continue to animate humanity transcending national and international boundaries. His contribution to human development is far too great and varied to have been forgotten or to be overlooked. The world today recognizes him as a far more compelling social innovator than humanity ever realized.

The life of Mohandas Karamchand Gandhi is a story of heroic effort to establish the values of 'truth' and 'non-violence' in human life. In pursuing this objective Gandhiji became a Mahatma from a mere 'Monya'. He became a messenger, for the people of the world surrounded by fire of violence in the twentieth century. He also became 'The Father of The Nation'. He saved India and Britain from mutual hate and revenge by resorting to the experiment of 'truth' and 'non-violence' in India's struggle for freedom. This created an atmosphere which made it possible for other countries of Asia and Africa to free themselves without bloodshed from the hold of the European countries which had subdued them in the nineteenth century.

> Gandhism is a body of ideas that describes the inspiration, vision and the life work of Mohandas Gandhi. It is particularly associated with his contributions to the idea of nonviolent resistance, sometimes also called civil resistance. The two pillars of Gandhism are truth and non-violence.

Teachings of Mahatma Gandhi

The twin cardinal principles of Gandhi's thought are 'truth' and 'non-violence'. For Gandhi, truth is the relative truth of truthfulness in word and deed, and the absolute truth - the Ultimate Reality. This ultimate truth is God (as God is also Truth) and morality - the moral laws and code - its basis. He explicitly mentions the six deadly enemies which cause prejudice, malice and ill-will to arise, on account of which the person is unable to see or feel the truth. These deadly enemies are desire, anger, greed, attachment, pride and jealousy. Therefore, in order to practice truth one must constantly endeavor to oneself from these evils, one must cultivate moral purity and courage and must not allow these enemies to cloud his vision.

Non-Violence

Mahatma Gandhi says that non-violence means to keep oneself completely away from such action which may hurt others physically or mentally. Non-violence is the most effective means to fight against discrimination and falsehood. Non-violence is one of the major moral qualities of human being. Non-violence is a power force than violence because it is linked with the bravery of mind. Non-violence is a powerful weapon of the strong. Mahatma Gandhi used non-violence not only for the purification of his soul, but to purify the conduct of the human society. He practiced non-violence in mass action and devised means to fight out injustice.

Apart from truth and non-violence, other principles are given below:

Swaraj

Although the word swaraj means self-rule, Gandhi gave it the content of an integral revolution that encompasses all spheres of life. At the individual level swaraj is vitally connected with the capacity for dispassionate self-assessment, ceaseless self-purification and growing swadeshi or self-reliance. Politically swaraj is self-government and not good government (for Gandhi, good government is no substitute for self-government). In the other words, it is sovereignty of the people based on pure moral authority. Economically, poorna swaraj means full economic freedom for the toiling millions. For Gandhi, swaraj of the people meant the sum total of the swaraj (self-rule) of individuals and so he clarified that for him swaraj meant freedom for the meanest of his countrymen. And in its fullest sense, swaraj is much more than freedom from all restraints, it is self-rule, self-restraint and could be equated with moksha or salvation.

Satyagraha

The Gandhian philosophy of satyagraha is a natural outcome of the supreme concept of truth. Satyagraha means the exercise of the purest soul-force against all injustice, oppression and exploitation. Satyagraha as conceived by Gandhi is not a formula of social and political disintegration. A satyagrahi must have first rendered willing obedience to the laws of the state and Gandhi laid down strict canons of moral discipline for the satyagrahi.

There are different forms of satyagraha. Non-cooperation with the evil doer is a mild form. Civil disobedience of the laws of the government is a strong and extreme form of satyagraha. There can be individual as well as mass civil disobedience.

Sarvodaya

Sarvodaya is a term meaning 'Universal Uplift' or 'Progress of All'. The term was first coined by Mohandas Gandhi as the title of his 1908 translation of John Ruskin's tract on political economy, "Unto This Last", and Gandhi came to use the term for the ideal of his own political philosophy.

Trusteeship

Trusteeship is a socio-economic philosophy that was propounded by Mahatma Gandhi. It provides a means by which the wealthy people would be the trustees of trusts that looked after the welfare of the people in general. Gandhi believed that the wealthy people could be persuaded to part with their wealth to help the poor.

The Relevance of Gandhi in the 21st Century

More than ever before, Mahatma Gandhiji's teachings are valid today, when people are trying to find solutions to the rampant greed, widespread violence and runaway consumptive style of living. Here, we will discuss the relevance of his teachings:

Education

Gandhi strongly holds the view that education must enrich human personality and integrate individuals as integral members of a dormant and dynamic society. As a creative unit in a co-operative society, all his activities must have a social content. Gandhi wanted to free education from government and state bureaucracy interference. He valued self-sufficiency and autonomy and the more financially independent the schools were, the more politically independent they could be. Gandhi wanted radical changes from what is common in education today. Long before today's "consume all" society, Gandhi was arguing that education had been turned into a commodity and that we should not assess the value of education in the same manner as we assessed the value of land or stock market shares.

But, the irony is that today, as India clings to its centralized, textbook-oriented, employment opportunity-driven education, several countries such as Britain, China, Bangladesh among others have moved towards many of Gandhi's teachings. China's rural education system incorporates far more features in its structure that Gandhi would approve of, than anything promoted by our government. Bangladesh has hundreds of non-government organizations delivering the "popular education" developed by philosopher Paulo Freire, similar to the teachings of Gandhi. In the West there has been a major move towards teaching and learning in the vernacular and local authorities, schools, teachers, pupils and parents have been allowed to have more influence over what is taught, and education is not seen simply as a ticket for a career.

Economics

In India, economic development has been mostly confined to the urban conglomerates. In the process, the rural India that comprises around 700 million people has been given short shrift. Gandhiji's philosophy of inclusive growth is fundamental to the building of a resurgent rural India. He believed in "production by the masses" rather than in mass production, a distinctive feature of the industrial revolution. Gandhi envisaged villages as self-sufficient republics. He knew that India lived in its villages, which is why he stressed on the growth of the rural economy such as khadi, handloom, handicraft and sericulture. This is why he advocated the establishment of cottage industries and recommended the use of rural products. According to him, the village economy would satisfy two important objectives. First, it would provide maximum employment and income to inhabitants, and second, it would generate equality, freedom and justice.

Further, according to him, large-scale production was meant to be profit-oriented and therefore, harmful for society as it could lead to concentration of wealth and power in a few hands. Gandhi advocated decentralisation because it could avoid violence. He suggested delocalisation of production as against concentration in particular areas. His beliefs on decentralisation were aimed at correcting all evils of a centralised economy.

Terrorism

In recent years, we have witnessed terrorist violence affecting almost all countries. Even the so called advanced, affluent nations suffer from the menace of terrorist violence. Today, people are divided not only on economic basis but also on national, regional and religious basis. In recent times, religious fundamentalism has assumed dangerous proportions though it has always existed in one form or the other. Racism, which yields violence, has become a device to assume important positions in public life, not only in India and Muslim countries but even in the USA and other countries also.

The situation demands that non-violent techniques as a means of

social change are put into practice immediately. Gandhiji held that violence was wrong as a matter of principle. According to him, resistance to violence by counter violence is obviously wrong. A wrong cannot be righted by another wrong. The addition of another wrong does not diminish but adds to the evil already in existence. So violence must first be resisted by persuasion and when persuasion fails, it must be resisted non-violently. Gandhi promoted non-violence not just as a philosophy and a political strategy, but as a means to achieve justice and change.

Cleanliness

Indians gained freedom under the leadership of Gandhiji, but his dream of a clean India is still unfulfilled. For Gandhi, the drive for cleanliness in society was an integral part of the process in bringing about a casteless and free society. Sanitation was also considered a necessity by Gandhi in order to remove the label attached to Indians being in need for the West's civilising mission. Connecting the issues of cleanliness and untouchability, Gandhi emphasised the fact that it is extremely unjust to look upon those who do scavenging to be of the lowest social status. Stressing upon the need for better living conditions for those who did manual scavenging, Gandhi insisted that each one of us should be our own scavenger. He observed that since scavengers were considered to be of low status, people had been neglecting sanitation as 'unclean' work.

So, in order to make cleanliness a people's movement (jan andolan), the government of India has launched 'Swachh Bharat Mission' in 2014. It aims to accelerate the efforts to achieve universal sanitation coverage in the country by this year as a tribute to Mahatma Gandhi on his 150th birth anniversary. Till now, this cleanliness campaign has not only improved the lives of crores of Indians, but it has also played a significant role in achieving the goals set by the United Nations (UN).

Ecological Issues

Environmental movements do not make a direct reference to Gandhi, although the methods that many of them adopt and the discourse that is moulded in their wake often contain Gandhian elements. One example is the Zapatista rebellion in Mexico, which, after a violent confrontation with government forces, turned to civilian-based forms of resistance. Its alternative model of organising society—based on the principles of autonomy, participation and public office — is seen as a form of service rather than as a source of power, suggesting strong Gandhian overtones.

In India, most of the environmental movements emerged in response to the developmental paradigm that the country adopted after Independence. They are centred on issues related to livelihood, land, water and ecological stability. What is remarkable about these movements is that many of them adopted Gandhian methods of action such as civil disobedience, burying themselves in coastal sand, Jal Satyagraha, long walks, hunger strikes, involvement of political and community leaders, petitioning to officials, dialogue with scientists and government officials and convening of all party meetings to build consensus. Coming to the notable environmental movements, we have the example of Chipko, Narmada and Silent Valley protests. The Chipko Movement is particularly noted for its Gandhian connections.

The focus of 21st century is on sustainable development. By definition, sustainable development is the development of the present generation without compromising the abilities of future generations. Though the concept of sustainable development was alien to Gandhi, his constructive programmes were the first expressions of such a development without destroying nature and natural environment. As the sustainable development goals (SDGs) envision, Gandhi also dreamt of a world where there is no poverty, inequality and injustice. Gandhi called it as Sarvodaya Society, an egalitarian society which guarantees to uplift the poorest of the poor. But unfortunately the objectives of Sarvodaya, that is, the individual freedom, self-sufficiency, communal harmony, economic equality and dignity of labour are still a distant dream for many in our democracy.

Way Forward

Despite impressive advances in science and technology and the growth of material wealth in the industrialised countries, humanity continues to be afflicted with poverty, famine, malnutrition, and lack of education and health care. Differences in race, religion and nationality continue to contribute to many regional, national and international tensions. And many countries and nations that were beacons of democracy are now seeing a rise in populism, religious nationalism and sectarian rivalries. Therefore, through-out application of his ideas to resolving present-day serious existential crisis could be of great value.

Further, Gandhi's enduring legacy is his continued relevance to our thinking and action on a broad sweep of issues, from protecting the environment to promoting justice, from education to inequality. His teaching remains fresh and thought-provoking, including his emphasis on the importance of facing up to the truth with courage. Indeed, many of his ideas foreshadow the holistic thinking behind the 2030 Agenda for Sustainable Development.

General Studies Paper- IV

Topic: Contributions of moral thinkers and philosophers from India and world.

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2. ISSUE OF PRIORITISING A LANGUAGE IN MULTI-LINGUAL INDIA

Why in News?

Recently, Union Home Minister Amit Shah on Hindi Diwas has once again generated fear, and apprehension among non-Hindi speakers. He accentuated that it was necessary to have Hindi as a common language for he felt that it has the potential to unite India, but backtracked after the suggestion came under criticism.

Introduction

Language as a potential ground for identity, power, unity and integrity has been the subject of debate among different political parties and linguistic groups in India for a considerable period of time. The argument for Hindi as a 'common language' or Rashtra Bhasha (national language) continues to attract a great deal of attention of scholars cutting across academic disciplines. This needs to be studied historically and analysed critically from the perspective of inclusive Indian nationalism. This is simply because the question of language has multiple and contentious layers in it.

Further, the recent National Education Policy draft has, yet again, sparked the age-old debate on the imposition of Hindi. A clause in the draft report recommended mandatory Hindi classes in all schools. However, after much backlash, especially from Southern states like Tamil Nadu, the clause was dropped. The very insertion of such a clause speaks volumes about the mindset of the people in the current administration. Portraying Hindi as a national language that should be synonymous with India as a nation is not a new trick of the government. In 2018, ahead of the 11th World Hindi Conference, the government proposed to make Hindi an official language of the UN. Even then, it received severe criticism from people and politicians belonging to the non-Hindi speaking belt.

The Constitutional Debate

As historian Ramachandra Guha argues, among the topics debated by the Constituent Assembly, the most controversial, contested and provocative question was language. A range of discussions was held on which language should be spoken in the Constituent Assembly, which language should be used to write the Constitution, and the language which should be given the singular label 'Rashtra Bhasha.'

Remarkably, R.V. Dhulekar, a renowned freedom fighter from Uttar Pradesh, opined that Hindi should be recognised as the national and the official language of the country. Some members also demanded that the official version of the Constitution be in Hindi, with an unofficial version in English.

However, the request was rightly refused. The primary contention in the assembly was that there are several languages such as Bengali, Oriya, Tamil that are ancient and have historical significance. In such a scenario, imposing Hindi across the country would be totally unjustified.

To rest the debate, the assembly finally adopted a formula devised by notable Constituent Assembly members K.M. Munshi and Gopalaswami Ayyangar. The Constituent Assembly have decided that the official language of the Union would be Hindi in the Devanagari script. However, it made it clear that the English language would continue to be used for all the official purposes for 15 years from the commencement of the Constitution.

Post-Independence Developments

In the post-independent India, two language commissions were set up – in 1955 and 1960 – to survey the progress of Hindi. The question of language was taken up once again by the Lok Sabha in 1963. While the proposed immediate implementation of the constitutional provision on official language, the parliamentarians from the South and Bengal argued strappingly for the retention of English. Consequently, a compromise was reached which led to the introduction of the Official Languages Act in 1963. The fundamental objective of this Act was to satisfy both the proponents of Hindi and non-Hindi members. As an advocate of inclusive nationalism, Nehru gave his personal assurances in parliament that there would be no attempt to impose Hindi on the non-Hindi speaking states.

Nevertheless, after Nehru's demise in 1964, the then home minister of India, Gulzarilal Nanda, a staunch advocate of Hindi, issued a new directive notice to all other Union Ministries to report on the progress made in promoting the use of Hindi for official purposes. He also asked to indicate the steps they propose to use Hindi after the designated day of transition on January 26, 1965.

When the news of this directive reached Tamil Nadu, there were massive student demonstrations, riots, and self-immolations, which continued for several months. Consequently, Union Ministers and the Chief Ministers of all the states met in Delhi in June 1965. A compromise was reached with an assurance that Hindi would never be imposed on non-Hindi speaking states.

This significant and historic compromise of 1965 was subsequently

Constitutional Provisions

1. Article 29 of the Constitution of India protects the interests of minorities. The Article states that any section of the citizens who have a "...distinct language, script or culture of its own shall have the right to conserve the same."
2. Under Article 120 of the Constitution of India, the business of the House is to be transacted in Hindi or in English, but a member who cannot adequately express himself in either of the two languages can, with the permission of the Speaker, address the House in any of the languages mentioned in the Eighth Schedule of the Constitution or in his mother tongue.
3. Article 343 of the Constitution of India is about the official language of the Union of India. According to this Article, it is to be Hindi in Devnagri script, and numerals should follow the international form of Indian numerals. This Article also states that English will continue to be used as an official language for 15 years from the commencement of the Constitution.
4. Article 346 of the Constitution of India is about the official language for communication between the states and between a state and the Union. The Article states that the "authorised" language will be used. However, if two or more states agree that their communications shall be in Hindi, then Hindi may be used.
5. Article 347 of the Constitution of India gives the President the power to recognise a language as an official language of a given state, provided that the President is satisfied that a substantial proportion of that state desires that the language be recognised. Such recognition can be for a part of the state or the whole state.
6. Article 350B of the Constitution of India provides for the establishment of a Special Officer for linguistic minorities. The Officer shall be appointed by the President and shall investigate all matters relating to the safeguards for linguistic minorities, reporting directly to the President. The President may then place the reports before each house of the Parliament or send them to the governmentss of the states concerned.
7. The Eighth Schedule of the Constitution of India contains a list of 22 recognised official languages.

introduced into the Official Languages Act through the Official Languages Amendment Act in 1967. This Act provided for joint use of Hindi and English in the Indian parliament. It also provided Hindi as the language of communication between the Centre and Hindi speaking states and English for communication between the Centre and non-Hindi speaking Indian states.

It is mentioned in the Constitution of India that Hindi should develop progressively. The members of the Constituent Assembly made this conscious decision not because Hindi was better or more powerful language than other languages, but for practical reasons.

Policy of Multilingualism

As a functional tool, language inherently serves a communicative function. It enables us to transfer knowledge and ideas, and serves to transmit cultural heritage and preserve historical memories. Multilingualism should be an aspirational value. This spirit of aspiration ought to inform the design of linguistic policies in multicultural societies. On average, we interact more frequently with people from diverse linguistic backgrounds than our ancestors. Language should be looked at as an important skill to operate in a world which is more connected today than at any other point in time. This is not to contend that our linguistic heritage should be neglected or trivialised.

The problem we faced at the time of drafting the Constitution, as we face even today, is that the approach towards linguistic policy seems to be driven more by the politics of identity than values of aspiration or accommodation. The primary argument in favour of Hindi has been reduced to assertions of slim majoritarianism. Even then, there are concerns about the claim based on mere numerical strength, as only 25 per cent of Indians seem to recognise Hindi as their mother tongue (Census 2011).

Today nearly 35% of people are migrating daily for work. In such a situation, we have to conceptualise a new form of language identity for our states. Our cities must be recognised as multilingual entities. This will help us in unhinging the education policy for some large metropolises. The current practice of clubbing together multilingual spaces with monolingual habitats is not fair to the large cities today. A united nation has to have space for diversity. India is united in its diversity. Diversity is a great philosophical idea and should never be seen as a cultural burden. We cannot discard it for a purely majoritarian reason. Any idea of one link language, whether Hindi or English, will be economically disastrous for India. It will slow down migration and reduce the ease of capital flow. It will not be wrong to say that all these emotive issues thrown in the country's face by the current dispensation keep diverting attention away from the economy, which has hit an alarming low.

Linguistic Disaster in India

Let us look at where the linguistic disaster has happened in our country. All tribal languages are rapidly disappearing. That is because there are not enough livelihood opportunities in those languages. Livelihood possibilities for tribals are diminishing; languages are not encouraged and people are getting assimilated in some larger language. This may appeal to some rabid pseudo-nationalists. But there is a huge loss entailed in the process, both economically and culturally. So far we have not monetised the loss caused. If we do that, the results would be shocking. Language diversity is a great economic proposition. India is uniquely gifted in that out of the world's 6,000 languages, we have close to 10% of the spoken languages.

Is it time to Rethink the Three-Language Policy?

There are no two opinions on what is good from the point of pedagogy. When a child goes to school, her initial language of instruction should be as close to the language spoken by her mother or home language. If it is Konkani or Bhojpuri, the primary schools must use that as a medium of instruction. Then, gradually, the child should be shifted to the state's official language, say, Marathi or Kannada. English can and should be taught from the beginning as a language but not as a medium of instruction. Those who need higher-level skills in English for higher or technical education should be given that, but everyone need not be burdened with that.

Hindi should be introduced in non-Hindi-speaking states from an early stage and the Hindi-speaking states should introduce a non-Hindi Indian language. That was the three-language formula. For a country like ours, this was a reasonable solution worked out by all Chief Ministers and backed by educationists in the Kothari Commission.

Sadly, the formula was sabotaged from two ends. While most non-Hindi speaking states did introduce Hindi, unfortunately the Hindi-speaking states bypassed the requirement to teach a non-Hindi language (preferably a South Indian language, said the original formulation). Instead of learning Tamil or Telugu — languages that are older and richer than Hindi — they fulfilled the third language requirement with perfunctory Sanskrit. What was a move to encourage national integration began to look like an imposition of Hindi.

Way Forward

Language, used as a political weapon, can be divisive and chauvinistic. It can be used to create hierarchical identities and unequal power dynamics. When we look at languages primarily as markers of identities, we build barriers to acceptability. People begin to assert linguistic supremacy, resist learning a language which they perhaps would not have objected to otherwise.

It is essential to move the discussion away from the binaries of Hindi and non-Hindi camps. The issue which merits attention is the manner in which linguistic policies ought to be designed in a multicultural society. The linguistic diversity that India has to negotiate is without precedent. We started off on a wrong foot at the time of Independence by confining language as an issue of identity. We must learn to avoid the same pitfalls which have damaged our polity so deeply.

General Studies Paper- II

Topic: Indian Constitution- historical underpinnings, evolution, features, amendments, significant provisions and basic structure.

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3. ONE NATION, ONE RATION CARD : NATION-WIDE PORTABILITY OF RATION CARD

Why in News?

In a bid to implement 'One Nation, One Ration Card' (ONORC) the Ministry for Food and Public Distribution has commenced pilots between Maharashtra - Gujarat and Andhra - Telangana and has committed to a national rollout by June 30, 2020.

Introduction

In India, food security system mainly focuses on supply of food grains and this is distributed through the Public Distribution System (PDS). The objectives of PDS are maintaining price stability of essential commodities, providing access to foods at affordable prices to the vulnerable people and to maintain minimum nutrition level to population. In the context of widespread poverty ratio, malnutrition and inflation in food prices, access to basic food at reasonable prices remains an important policy intervention. India's PDS now has a significant impact on rural poverty. On Independence Day this year, Prime Minister Narendra Modi called for national integration through several "one nation" initiatives such as a singular mobility card, tax regime and electricity grid. One such initiative, One Nation, One Ration Card (ONORC), is meant to enable a resident from, to access her food rations in Patna or Mumbai.

The Economic Survey 2017 estimated that over nine million Indians change their state every year. For them, the ONORC is a gamechanger because it makes their rations "portable", allowing them to pick up foodgrains from any ration shop in the country. It also benefits non-migrants by allowing them to transact at better-performing shops locally. This local "choice effect" is extremely popular in Andhra Pradesh, which has introduced such portability within the state since October 2015. A study by researchers at the Indian School of Business (ISB) found that over 25 per cent of PDS beneficiaries in the state now use portability. However, we must approach this bold vision with utmost caution because PDS is a crucial lifeline for many of the 800 million Indians it reaches.

One Nation, One Ration Card

The ONORC entails integration of the existing PDS systems or portals of states and UTs with those of the Centre under a central repository of all National Food Security Act (NFSA) ration cards and beneficiaries. The central repository also ensures that no duplicate ration cards and beneficiaries exist in any state or UTs. The ONORC scheme is implemented across the nation and for that data of all ration cards will be connected to one server and any beneficiary, anywhere in the country, will be able to pick up their grain from any public distribution system of their choice after 30th June, 2020. Currently, in four states — Andhra Pradesh, Telangana, Gujarat, and Maharashtra—both intra-state and inter-state portability of ration card is being implemented. Seven other states—Haryana, Jharkhand, Karnataka, Kerala, Punjab, Rajasthan and Tripura—are, at present, testing intra-state portability that would allow beneficiaries to lift their quota of ration from any fair price shop (FPS) store within that state.

- According to food ministry officials, the key focus of the scheme is ensuring that beneficiaries covered under NFSA are not denied their rations because of inter-state migration.
- Currently, a large chunk of the labour force mostly covered under NFSA travels from states like Uttar Pradesh, Bihar, Madhya Pradesh, Odisha, etc, to more economically advanced states, such as Punjab, Haryana, Maharashtra, in search of livelihood. This migration pattern is seasonal, especially at the beginning of the sowing of rabi and kharif crops, and during their harvesting.
- By January 2020, 11 states will form a public distribution grid. The central scheme will integrate all state public distribution systems to a central repository of beneficiaries' details.
- Ration cards are usually issued by states, under the NFSA. Beneficiaries now have access to ration shop in issuing states alone.
- Women shifting to different states post-marriage and migrant workers are affected by this. Some 4.1 crore workers migrate out of their states seasonally for work (2011 census).

Issues and Challenges in ONORC

There are several issues related to the two elements of access that ONORC can potentially resolve:

- The first relates to the amenability of ONORC for migrants. Identification of beneficiaries is transaction-cost heavy and is fraught with several inclusion and exclusion errors. If a household moves, to become eligible, the costs must be incurred all over again.
- Conditional on eligibility, the experience with PDS depends considerably on the last node of delivery — FPS. Across the three researched states — Bihar, Odisha and Uttar Pradesh — beneficiaries complained about discrimination by the dealers, especially against women and in terms of providing quality services.
- For rolling out the ONORC move pan-India, all PDS shops should install electronic Point of Sale (ePoS) machines and all ration cards have to be seeded with Aadhaar numbers. Currently, around 77% of FPSs—4.12 lakh of the 5.34 lakh operating across the country—have installed ePoS machines. Two key states—West Bengal and Bihar—that witness huge labour emigration, have been laggards in this regard.
- ONORC will be particularly beneficial for women and other disadvantaged groups, given how social identity (caste, class and gender) and other contextual factors (including power relations) provide a strong backdrop in accessing PDS.
- Further, the quality of services is markedly inferior for the subaltern groups with latent methods of discrimination such as lack of information, mixing of inferior grains, longer waiting time and, at times, even verbal abuse.

Further, there is widespread denial of entitlement, with households not getting the quantity or paying the price that they are entitled to. The State of Aadhaar Survey 2017-18 found that nearly 6.5 per cent of PDS beneficiaries in Rajasthan were denied ration because the shopowner claimed to be out of food grain. This translates to over 3.5 million people in Rajasthan alone.

Restructuring the PDS

While we acknowledge that access to food through state transfers will require shifts in power relations and changes in the structural features that would involve challenging, renegotiating and transforming unequal social relationships, initiating institutional reforms of ONORC might bridge some of the gaps.

Further, to see the benefits of ONORC, it is important to understand the functioning of the PDS across the value chain. Two processes central to the PDS are: identification of beneficiaries; and due allocation as per the attributes (price, quantity), besides meeting the requirement of the quality and variety of grains. Some other important issue, which need to resolve while thinking about the ONORC initiative are:

- First, fundamental processes related to the PDS need to be redesigned to empower every individual. A beneficiary has no

mechanism to question whether the shop owner is telling the truth or diverting rations. Portability and biometrics will not solve this problem completely. The state government collects feedback in real time through a mobile-based system. The central government should use this opportunity to make PDS more user-centric.

- Second, the operational backbone of the PDS needs to be restructured to promote portability. States should be brought together on a national platform that is based on the same technical standards and can therefore "speak" to each other (what technologists call "interoperability"), so that portability works seamlessly across states. The system should be based on what technologists call "open APIs" so that states can customise the user interface to their local needs, and add features and additional entitlements as they deem fit. The system should enable real time tracking of inventories and rapid response to low stock situations.
- Thirdly, while leveraging the power of AADHAR for PDS, the government should actively address privacy and exclusion risks that the use of AADHAAR and a centralised PDS platform can lead to. The government should also acknowledge that authentication failures will happen in any biometric system. To prevent denial of service, the government should ensure availability of non-biometric means of authentication (such as OTP or PIN), as well as manual overrides.

Government Initiatives in Reforming PDS

PDS reforms specially following passage of NFSA, 2013. Cutting pilferage from the PDS is becoming far easier with almost all of the 23 crore ration cards in the country being digitised and 56% of these already seeded with unique identification number AADHAAR. Besides, several states have now installed ePOS devices at their fair price shops to track the sale of foodgrains to actual cardholders on a real-time basis.

- **End-to-end Computerisation of PDS Operations Scheme:** The Department of Food and Public Distribution, in association with all states and UTs, is implementing the scheme. The expected outcome of their activities are:
  - **Digitisation of beneficiary database:** Enable correct identification of beneficiaries, remove bogus cards and better targeting of food subsidies.
  - **Online allocation of foodgrains:** System generated allocation of foodgrains to bring transparency.
  - **Computerisation of supply chain management:** This will ensure timely availability of foodgrains to intended beneficiaries at FPS and also keep a check on leakages.
  - **Grievance redressal mechanism and transparency portals:** Increase transparency and public accountability in the implementation of targeted public distribution system (TPDS) through transparency portals, online grievance registration and toll-free helpline numbers.
- **Assistance to State Governments:** According to the NFSA, the central government is required to provide assistance to state governments to meet the expenditure incurred by it on intra-state movement, handling of foodgrains and margins paid to fair price shop dealers, for distribution of foodgrains allocated for the entitled persons and households. The central provides

50:50 cost sharing in respect of general category states and 75% for North-Eastern or hilly or island states.

- **One-time Assistance to State Food Commissions:** The NFSA also states that the state governments will have to set up a state food commission for monitoring and review of the implementation of the Act. If the states decide to set up food commission exclusive basis, then the central government will provide one-time financial assistance for non-building assets under the Scheme on "Strengthening of PDS & Capacity Building, Quality Control, Consultancies & Research". However, no assistance will be given for any construction activity or any recurring expenses.
- **Awareness Scheme:** The main objective to this is to set up an effective, sustained and intensive awareness campaign, whose impact can reach the urban as well as rural and remote areas.

Conclusion

ONORC shall be helpful for the large migratory population of the country, who migrate from one part of the country to another in search of job or employment, marriage, or any other reason, and find difficulty in accessing subsidised foodgrains in the present system. The central government adopt a patient path of "a hundred small steps" while implementing this vision. It should start by encouraging all states to roll out within-state portability. Use of technologies like installation of ePoS machines at FPSs and computerisation of supply chain management of FCI operations would help in increasing the overall efficiency of the entire process, while maintaining transparency and curbing corruption. In the meantime, it should work on a national technical platform that works for all states. Such a gradual rollout will prevent transition glitches that show up as harmless statistics in reports, but are a matter of life and death for millions in our country.

General Studies Paper- II

Topic: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Topic: Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes; mechanisms, laws, institutions and Bodies constituted for the protection and betterment of these vulnerable sections.

General Studies Paper- III

Topic: Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System-objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.

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4. IMPLICATIONS OF PM MODI'S SPEECH IN UNGA

Why in News?

Prime Minister (PM) Narendra Modi has addressed the 74th session of the UNited Nations General Assembly (UNGA) on September 27, 2019. The focus of his speech, delivered in Hindi, was on development in the country and climate change.

Introduction

In an address to the 74th session of the UNGA that combined elements of a campaign speech and a call to action, Prime Minister Narendra Modi has showcased his government's developmental and environmental record, and set out its agenda. PM Modi spoke for around 17 minutes, well within the allotted time-limit of between 15 and 20 minutes, for a world leader to address the global body. In his 17 minute address, he did not mention the name of any country but firmly focused on terror, saying lack of unanimity on the issue dents those very principles that are the basis for the creation of UN.

Apart from terrrorism, he also spoke on a host of issues ranging from climate protection and global peace to his government's efforts at helping the marginalised. PM Modi also spoke about his government's various welfare schemes that "gave the world a new hope" for a better tomorrow. He emphasised on the motto 'Sabka Saath, Sabka Vikas' and said that his government's endeavours are centred around 130 crore Indians. Further, PM Modi also refused to get into 'you versus me' debate on Kashmir. He was clear that there will be no compromise on Kashmir and that being a global forum like the UN. His speech was in contrast to Pakistan PM's address that focused entirely on the Kashmir dispute.

In his speech PM Modi stressed on India's many global contributions that held lessons for other nations, rather than allowing himself to be limited by regional matters.

Key Highlights of the Speech

Terrorism

Noting that India is a country, that has given the world, not war, but Buddha, "Yuddh nahi, buddh" and Buddha's message of peace. He also emphasised that the onus of combating terrorism should not fall on any single country alone but for the entire world and humanity. Further, he said our voice against terrorism to alert about this evil rings with seriousness and outrage. For the sake of humanity, it is absolutely imperative that the world unites as one against terrorism and stands as one against terrorism. The face of the world is changing, modern technology is bring about sweeping changes in different spheres of life. In such a situation, a fragmented world is in the interest of no one.

Global Peace and Harmony

PM Modi said the world is celebrating the 150th birth anniversary of Mahatma Gandhi, whose message of truth and non-violence is very relevant for us even today, for peace, development and progress in the world. In the last 5 years, India has worked towards strengthening its centuries old great tradition of fraternity among nations and welfare of the world, which is indeed, in line with the key objectives of the United Nations. The issues that India raises, the kind of new global platforms that India has come forward to build, seek collective efforts to address serious global challenges and issues.

Further, he invoked the quotes of Tamil philosopher Kaniyan Pungundranar and Swami Vivekananda to seek collective action to address various global challenges. About 3000 years ago, Kaniyan Pungundranara quoted "Yaadhum oorae, yaavarum kaeleer". This means, we belong to all places, and we belong to everyone. This sense of belonging beyond borders is unique to India.

Besides, PM Modi also referred to Swami Vivekananda's historic address at the convention of Parliament of Religions in Chicago and asserted that India's message to the global community remained the message of harmony and peace which the spiritual guru gave in 1893. Today, the message from the world's largest democracy, for the international community is still the same: "Harmony and Peace".

UN Peacekeeping Mission

India made more sacrifices than any country for UN peacekeeping missions. The Prime Minister also reminded the UNGA about the sacrifices made by Indian soldiers as part of UN peacekeeping missions. He said at least 160 Indian peacekeepers have paid the ultimate price while serving with the United Nations.

Climate Change

India one of leading nations in fight against climate change. Elucidating steps taken to fight climate change, PM Modi said India's contribution to greenhouse gas emissions is very low and still is one of the leading nations to combat climate change. He said that "on one hand, we are working towards achieving the target of 450 Giga Watts of renewable energy, and on the other hand, we have also taken the initiative to create the International Solar Alliance. PM Modi also stressed on the increasing number and severity of natural disasters due to increasing global warming.

Further, to combat natural disasters, India has initiated the formation of the 'Coalition for Disaster Resilient Infrastructure' (CDRI) with countries like the UK, Australia, Fiji and the Maldivives. This coalition will help build infrastructure which can withstand natural disasters. In addition to that he also invited "all countries to join" the CDRI.

Further, in order to signifying its commitment to sustainability and climate action, India has gifted solar panels -- one each for the 193 UN member states - that are being installed on the roof of the UN headquarters.

Single-use Plastic and Cleanliness

PM Modi spoke about the scale of the 'Swachh Bharat Abhiyaan' and said that when a developing nation successfully completes the world's biggest cleanliness drive, builds more than 11 crore toilets in just 5 years for its citizens, all its achievements and outcomes are an inspirational message for the entire world. The campaign was launched by the Modi government on Gandhi's birth anniversary on October 2, 2014. The components of the government's flagship scheme include the construction of household toilets, community and public toilets and solid waste management.

PM Modi also told the gathering that India is running a big campaign in India to free the country of single-use plastic.

Digital Identification Programme

Referring to the AADHAR initiative, PM Modi said, "when a developing country, launches for its citizens, the world's biggest digital identification program, giving them a biometric identity, thereby ensuring they can avail of their rights, and saves more than 20 billion dollars by checking corruption, the modern systems that result from it, give the world a new hope."

Health

PM Modi said that when a nation successfully runs the world's biggest health insurance scheme 'Ayushman Bharat', providing free medical treatment up to Rs 5 lakh for over 50 crore people, then it shows a new path to the entire world. He also recounted India's achievements in the health sector and said that the country is

committed to eradicating Tuberculosis by 2025.

Financial Inclusion

PM Modi referred to the 'Pradhan Mantri Jan Dhan Yojana' and said that in just five years, more than 37 crore people have got bank accounts opened. This builds trust in the poor people across the world and prime example of financial inclusion.

Multilateralism

Prime Minister urged the international community to give a new direction to multilateralism. He said as the world is going through a new era, the countries do not have the option to confine themselves within their boundaries. Modern technology in the 21st Century, is bringing about sweeping changes in social life, personal life, economy, security, connectivity and international relations. In such a situation, a fragmented world, is in the interest of no one. He also said that, India's position has been that institutions like the UN need to be strengthened and also reformed because its current structure does not reflect the state of play in global politics.

Reformed multilateralism has been a theme Modi has been driving home at all international forums, most recently in the G-20 meet in Osaka in June.

Infrastructure

PM Modi stressed that in the next 5 years, apart from promoting water conservation, India is going to ensure water supply to 150 million homes, build over 125,000 kilometers of new roads and build 20 million houses for the poor by the year 2022, when India celebrates its 75th Independence day.

Governance

PM stressed that India is a great culture that is thousands of years old, a culture that has its own vibrant traditions, and which has encompassed universal dreams. Our values and culture see divinity in every being and strive for the welfare of all. Therefore, the very core of our approach is public welfare through public participation and this public welfare is not just for India but for the entire world. And that is the reason we draw inspiration from our motto: Collective efforts, for growth of all, with everyone's trust. And this too, is not confined within the borders of India.

Way Forward

Prime Minister Narendra Modi's speech at the 74th session of United Nations General Assembly (UNGA), detailing outlines to build an inclusive, assertive and accountable world, has not only made a global impact but has also enhanced India's stature on the world stage. Further, it implies that India is an example to the world and the world could seek motivation from the developing country.

General Studies Paper- II

Topic: Important International institutions, agencies and fora- their structure, mandate.

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5. QUANTUM SUPREMACY : NEXT ERA OF COMPUTATIONAL EVOLUTION

Why in News?

Google is working on its first demonstration of quantum supremacy, in which a quantum computer outperforms a conventional computer. The current approaches to quantum computing are scientifically interesting, but the challenge to scaling them up to practically useful applications is formidable. Recently, a draft research paper claimed Google researchers have achieved a long-sought-after goal in physics called "quantum supremacy".

Introduction

Quantum computing is the use of quantum-mechanical phenomena such as superposition and entanglement to perform computation. A quantum computer is used to perform such computation, which can be

implemented theoretically or physically. The field of quantum computing is actually a sub-field of quantum information science, which includes quantum cryptography and quantum communication.

Quantum computing was started in the early 1980s when physicist Paul Benioff proposed the first quantum mechanical model of the turing machine. Richard Feynman and Yuri Manin then expressed the idea that a quantum computer had the potential to simulate things that a classical computer could not. In 1994, Peter Shor published an algorithm that is able to efficiently solve some problems that are used in asymmetric cryptography that are considered hard for classical computers.

There are currently two main approaches to physically implementing a quantum computer: analog and digital. Analog approaches are further divided into quantum simulation, quantum annealing, and adiabatic quantum computation. Digital quantum computers use quantum logic gates to do computation. Both approaches use quantum bits or qubits.

The phrase "quantum supremacy" was coined in 2011 by John Preskill, Professor of Theoretical Physics at the California Institute of Technology in a talk he delivered on the benefits of using quantum hardware over traditional computers.

Quantum supremacy refers to a quantum computer solving a problem that cannot be expected of a classical computer in a normal lifetime. This relates to the speed at which a quantum computer performs.

Difference between Conventional Computing and Quantum Computing	
Conventional Computing	**Quantum Computing**
Conventional computing is based on the classical phenomenon of electrical circuits being in a single state at a given time, either on or off.	Quantum computing is based on the phenomenon of Quantum Mechanics, such as superposition and entanglement, the phenomenon where it is possible to be in more than one state at a time.
Information storage and manipulation is based on "bit", which is based on voltage or charge; low is 0 and high is 1.	Information storage and manipulation is based on Quantum Bit or "qubit", which is based on the spin of electron or polarization of a single photon.
The circuit behavior is governed by classical physics.	The circuit behavior is governed by quantum physics or quantum mechanics.
Conventional computing use binary codes i.e. bits 0 or 1 to represent information.	Quantum computing use Qubits i.e. 0, 1 and superposition state of both 0 and 1 to represent information.
Complementary metal-oxide-semiconductor (CMOS) transistors are the basic building blocks of conventional computers.	Superconducting Quantum Interference Device or SQUID or Quantum Transistors are the basic building blocks of quantum computers.
In conventional computers, data processing is done in Central Processing Unit or CPU, which consists of Arithmetic and Logic Unit (ALU), processor registers and a control unit.	In quantum computers, data processing is done in Quantum Processing Unit or QPU, which consists of a number of interconnected qubits.

Google's Quantum Breakthrough

Last Month, an historic claim from Google was accidentally (and briefly) posted online: its Artificial Intelligence (AI) Quantum research group had achieved "quantum supremacy," an important step towards ultra-powerful computers that can solve problems deemed impossible for current machines by using quantum physics. The big reveal was somewhat thwarted by contributing researchers at NASA, who accidentally made a draft paper available. Not prone to understating its successes, Google made its bold assertion in the title of its research paper: "Quantum supremacy using a programmable superconducting processor." Though the paper was quickly taken down, copies of it were archived and are floating around the web.

Before the inadvertent announcement about supremacy, Google was already leading the pack in terms of the sheer size of its quantum computer. Last year it revealed a new 73-qubit computer, putting it ahead of closest rival IBM, which happened to announce its own development of a 53-qubit computer on September 18. For its supremacy demonstration, however, Google used a different, smaller computer, named Sycamore. As described in the leaked paper, Google used a 53-qubit processor (originally 54 qubits, but one qubit let the team down) to perform a sampling task. Now it appears that Google has reached this particular milestone ahead of its competitors. The draft paper details how Google researchers used a quantum processor called Sycamore containing 53 functioning qubits to solve a random sampling problem that would have taken the world's best supercomputers 10,000 years to work out. It took Sycamore just three minute and 20 seconds. Google, which partnered with NASA for this project, did not respond to requests for comment. For Ares, the Google news is exciting, but it's important not to expect useful quantum computers any time soon. The largest quantum computer to date is Google's 72-qubit processor called Bristlecone, and that hasn't even demonstrated quantum supremacy. We're a really long way off the millions of qubits we'll need to crack difficult quantum problems.

What is 'Quantum Supremacy'?

Quantum supremacy is the point at which quantum computers can solve problems that are practically

Quantum Theory

Quantum theory's development began in 1900 with a presentation by Max Planck to the German Physical Society, in which he introduced the idea that energy exists in individual units (which he called "quanta"), as does matter. Further developments by a number of scientists over the following thirty years led to the modern understanding of quantum theory.

The Essential Elements of Quantum Theory:

- Energy, like matter, consists of discrete units, rather than solely as a continuous wave.
- Elementary particles of both energy and matter, depending on the conditions, may behave like either particles or waves.
- The movement of elementary particles is inherently random, and, thus, unpredictable.
- The simultaneous measurement of two complementary values, such as the position and momentum of an elementary particle, is inescapably flawed; the more precisely one value is measured, the more flawed will be the measurement of the other value.

unsolvable for "classical" (non-quantum) computers to complete in any reasonable timeframe. In principle, even the simplest universal computer can solve anything that is computable given infinite time to do so. So, "supremacy" is a matter of how quickly and reliably a computer can solve a problem. The purpose is to built a quantum device that can do at least one thing which is outside the reach of classical machines.

It is generally believed that at least 49 qubits are required to cross the quantum supremacy line. Qubits behave very differently to bits in classical computers. Bits represent either a "1" or a "0," and computers read and perform operations on one bit at a time. In contrast, qubits can represent a combination state made up of both "1" and "0," due to the peculiar quantum effects in which properties like particle position, direction, and momentum are not well-defined. This allows for a system to be in multiple states at the same time, called quantum indeterminacy.

Classical Computers vs Quantum Computer

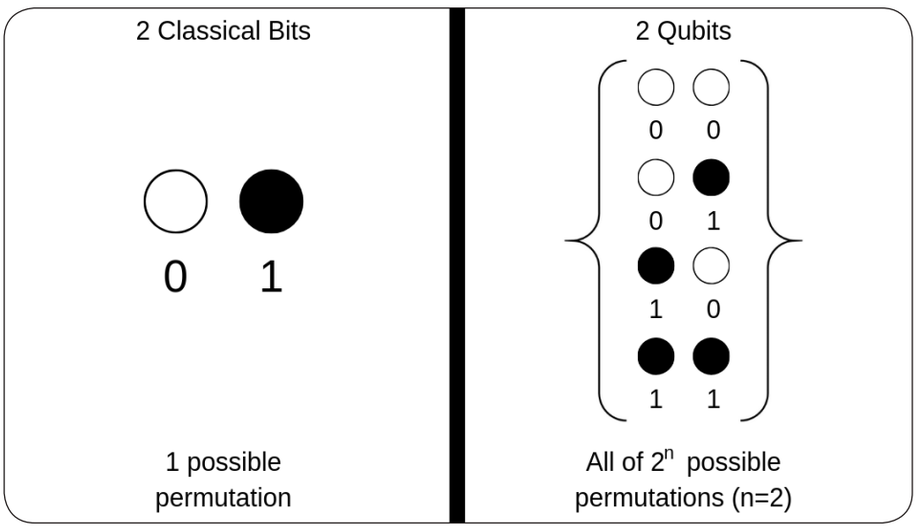
It just means the moment that a quantum computer completes a task that conventional computers find impossible. Classical computers transmit bits of information as electrical pulses encoded numerically as a 0 or a 1. In quantum computers, individual atoms, electrons, or particles of light carry information in quantum bits, or qubits. Following principles of quantum mechanics, these particles can exist in 0, 1, or various probabilities of being either 0 or 1, called superposition. With qubits in superposition and communicating with each other through a property called entanglement, quantum computers can solve a problem by examining multiple solutions simultaneously. The result is extra computing power and speed.

But keeping the "quantumness" in qubits is a big challenge. Multiple qubits need to interact with each other to solve problems in a quantum computer, but any interaction with other particles causes them to lose their quantum states. Once a qubit settles into either a 0 or 1, it acts just like a bit in a classical computer. As the result of research over the past decade, scientists can now build qubits that remain connected 10,000 times longer than before. But still less than 10 qubits can be fully quantumly connected.

Are Computers Finally Going Quantum?

In 2018, tech giant 'Microsoft' hired a handful of quantum physicists, including one from the Kavli Institute of Nanoscience in the Netherlands, to help build a prototype quantum computer – a machine that would harness the bizarre behavior of matter at extremely small scales to solve some of the hardest problems in science. Other companies are also working to commercialize quantum computers. IBM is planing to have a commercially available quantum processor in the cloud within a few years. Intel, Google and smaller start-ups also developing similarly powerful devices are beginning to transform their quantum-computing plans into reality.

If one of these teams of physicists and engineers wins the race to build the world's first quantum computer, it would outcompute classical computers by a long shot and help tackle currently unsolvable problems in fields ranging from finance to cybersecurity, and from drug development to quantum physics itself.



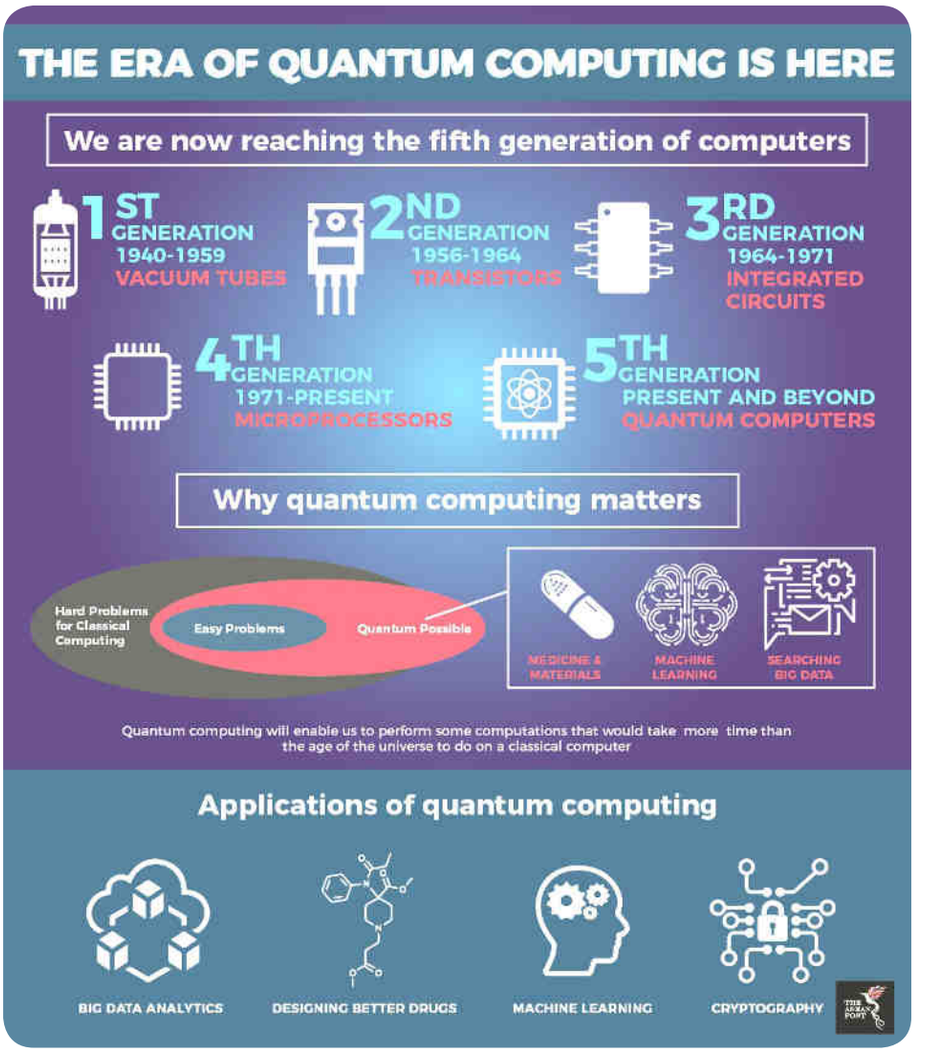
But there are still major technical challenges to overcome, including how to scale up current designs to link hundreds or thousands of quantum bits (qubits), the basic information carriers in a quantum computer, and how to control qubits' strange behavior.

Applications

Despite hitting the milestone, it's likely that quantum computers capable of tackling practical tasks are still years away. However, once developed, the computers are expected to have huge implications for areas as diverse as cryptography, chemistry, AI and machine learning. Google expects the power of quantum computers to expand at a "double exponential rate," whereas traditional computers have long been pegged to Moore's Law, which saw power double every 18 months or so.

Quantum physics had already transformed society. It has led to the laser and transistor and all of our modern technologies today. We are now on the brink of the second quantum revolution as we begin to harness all of the power of the quantum world. Quantum information processing will not only transform communication and security, but will impact healthcare, climate modeling, scientific research and machine learning.

Overall, from managing money to massive datasets, quantum computing's applications are seemingly endless. Advances in machine learning and optimization could boost efficiency dramatically. Biomedical and chemical simulations could help us land more drug discoveries and uncover new medical treatments in record time. Advanced computing power could lead to more than just innovation; it also could lead to lessened risk. Indeed, enhanced financial services could fundamentally change how we invest.



Way Forward

Besting conventional computers at solving a real-world problem—a feat that some researchers refer to as "quantum advantage." The hope is that quantum computers' immense processing power will help uncover new pharmaceuticals and materials, enhance artificial-intelligence applications, and lead to advances in other fields such as financial services, where they could be applied to things like risk management.

It could take quite a few years for quantum computers to achieve their full potential. Universities and businesses working on them are facing a shortage of skilled researchers in the field—and a lack of suppliers of some key components. But if these exotic new computing machines live up to their promise, they could transform entire industries and turbocharge global innovation.

General Studies Paper- III

Topic: Science and Technology- developments and their applications and effects in everyday life.

Topic: Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

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6. THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE : IPCC REPORT

Why in News?

A new report titled, 'The Ocean and Cryosphere Climate' released by the Intergovernmental Panel on Climate Change (IPCC), has given further strength to growing demands for more aggressive climate action from world leaders, especially those representing the big emitters.

Introduction

The latest report, on Ocean and Cryosphere, is the last in a series of three that the IPCC had been asked to produce to assess the impacts of climate change on specific themes. The first of these, examining the feasibility of restricting global rise in temperatures to within 1.5°C from pre-industrial times, was submitted in October last year. It was followed in August this year by a report on how land systems contribute to and are impacted by climate change.

The IPCC special report on the 1.5°C goal, for example, said it was possible to keep the rise in temperature to within 1.5°C, but for that the world would need to bring down its greenhouse gas emissions to half of its 2010 levels by 2030, and to net zero by 2050. Net-zero is achieved when the total emissions is balanced by the amount of absorption of carbon dioxide through natural sinks like forests, or removal of carbon dioxide from the atmosphere through technological interventions.

The land report released in August said the various kinds of uses that land was being put to — forestry, agriculture, industries, urbanisation had contributed about 5.2 billion tonnes of carbon dioxide every year between 2007 and 2016. During the same time, trees and forests absorbed almost 11.2 billion tonnes of carbon dioxide every year from the atmosphere. The sum total of these two processes meant that land, and the vegetation on it, was removing about 6 billion tonnes of carbon dioxide from the atmosphere annually.

It also pointed out that the global food system, which would include activities such as agriculture, cattle-rearing, food processing industry, energy consumed in these processes, and transportation of food items, could account for as much as a third of all greenhouse gases. It said nearly 25 per cent of all food produced globally was either lost or wasted. And even the decomposition of waste food released emissions.

IPCC Report on Ocean and Cryosphere

Over the last decades, global warming has led to widespread shrinking of the cryosphere, with mass loss from ice sheets and glaciers, reductions in snow cover and Arctic sea ice extent and thickness, and increased permafrost temperature. Global mean sea level (GMSL) is rising, cryospheric and associated hydrological changes have impacted terrestrial and freshwater species and ecosystems, coastal ecosystems are affected by ocean warming, including intensified marine heatwaves, acidification, loss of oxygen, salinity intrusion and sea level rise, in combination with adverse effects from human activities on ocean and land. Impacts are already observed on habitat area and biodiversity, as well as ecosystem functioning and services. The report seeks to underline the enormity of the problem, and the urgency required to deal with it.

Key Findings

- **The need for this report:** "Pervasive ocean and cryosphere changes are already being caused by human-induced climate change."
- **High mountain areas:** Glaciers could lose a fifth of their mass this century if emissions are low, and more than 80% in regions such as Central Europe.
- **Sea ice:** There is "very high confidence" that Arctic sea ice has declined in all months of the year and around half the summer loss is due to human-caused warming.
- **Ice sheets:** Greenland melt is unprecedented in at least 350 years. With rising Antarctic loss, ice sheets are now contributing 700% more to sea levels than two decades ago.
- **Implications of polar warming:** Polar bears are travelling further due to less ice, while Arctic peoples and marine life face rising negative impacts due to warming.
- **Abrupt changes and 'tipping points':** The Atlantic meridional overturning circulation (AMOC) ocean current that brings warm water to Europe may already have weakened by 15%, but is "very unlikely to collapse" this century.
- **Permafrost:** Arctic near-surface permafrost faces "widespread disappearance", with a 30-99% decrease in area if emissions are very high, releasing 10s to 100s of billions of tonnes of CO_2.
- **Sea level rise:** The rate is accelerating and is "unprecedented" over the past century. Worst-case projections are higher than thought and a 2m rise by 2100 "cannot be ruled out".

- **Impacts for coasts and islands:** Warming could "drastically alter" migration flows. If emissions are high, some island nations are "likely" to become "uninhabitable" this century.
- **Marine life:** Marine mammals could decline by 15% and fisheries by a quarter this century, if emissions are very high, while "almost all coral reefs will degrade" even if emissions are low.
- **Extreme events:** Cyclones, marine heatwaves and other extremes are becoming more severe and will exceed the limits of adaptation, causing "unavoidable loss and damage".
- **Socio-economic implications:** Changes to oceans and the cryosphere will impede the UN's sustainable development goals and could expand the range of disease threats.

Ocean and Cryosphere

The global ocean is the interconnected body of saline water that encompasses polar to equatorial climate zones and covers 71% of the Earth surface. It includes the Arctic, Pacific, Atlantic, Indian, and Southern oceans, as well as their marginal seas. The ocean contains about 97% of the Earth's water, supplies 99% of the Earth's biologically-habitable space, and provides roughly half of the primary production on Earth. The ocean is a fundamental climate regulator on seasonal to millennial time scales. Seawater has a heat capacity four times larger than air and holds vast quantities of dissolved carbon. Heat, water, and bio-geochemically relevant gases (e.g., oxygen (O_2) and carbon dioxide (CO_2) exchange at the air-sea interface, and ocean currents and mixing caused by winds, tides, wave dynamics, density differences, and turbulence redistribute these throughout the global ocean.

The cryosphere refers to frozen components of the Earth system that are at or below the land and ocean surface. These include snow, glaciers, ice sheets, ice shelves, icebergs, sea ice, lake ice, river ice, permafrost and seasonally frozen ground. Cryosphere is widespread in polar regions and high mountains, and changes in the cryosphere can have far-reaching and even global impacts. Presently, around 10% of Earth's land area is covered by glaciers or ice sheets, which in total hold about 69% of Earth's freshwater.

Role of the Ocean and Cryosphere in the Earth System

The ocean and cryosphere play a key role in the Earth system. Powered by the Sun's energy, large quantities of energy, water and biogeochemical elements (predominantly carbon, nitrogen, oxygen, and hydrogen) are exchanged between all components of the Earth system, including between the ocean and cryosphere.

Ocean and Cryosphere in Earth's Energy, Water and Biogeochemical Cycles

During an equilibrium (stable) climate state, the amount of incoming solar energy is balanced by an equal amount of outgoing radiation at the top of Earth's atmosphere. At the Earth's surface energy from the sun is transformed into various forms (heat, potential, latent, kinetic, and chemical), that drive weather systems in the atmosphere and currents in the ocean, fuel photosynthesis on land and in the ocean, and fundamentally determine the climate. The ocean has a large capacity to store and release heat, and the Earth's energy budget can be effectively monitored through the heat content of the ocean on time scales longer than one year. The large heat capacity of the ocean leads to different characteristics of the ocean response to external forcings compared with the atmosphere. The reflective properties of snow and ice also play an important role in regulating climate, via the albedo effect. Increased amounts of solar energy are absorbed when snow or ice are replaced by less reflective land or ocean surfaces, resulting in a climate change feedback responsible for amplified changes.

Water is exchanged between the ocean, the atmosphere, the land, and the cryosphere as part of the hydrological cycle driven by solar heating. Evaporation from the surface ocean is the main source of water in the atmosphere, which is moved back to the Earth's surface as precipitation. The hydrological cycle is closed by the eventual return of water to the ocean by rivers, streams, and groundwater flow, and through ice discharge and melting of ice sheets and glaciers. Hydrological extremes related to the ocean include floods from extreme rainfall (including tropical cyclones) or ocean circulation-related droughts, while cryosphere-related flooding can be caused by rapid snow melt and meltwater discharge events.

Interactions Between the Ocean and Cryosphere

The ocean and cryosphere are interconnected in a multitude of ways. Evaporation from the ocean provides snowfall that builds and sustains the ice sheets and glaciers that store large amounts of frozen water on land. Ocean temperature and sea level affect ice sheet, glacier and ice-shelf stability in places where the base of ice bodies are in direct contact with ocean water. The non-linear response of ice melt to ocean temperature changes means that even slight increases in ocean temperature have the potential to rapidly melt and destabilise large sections of an ice sheet or ice shelf.

The cryosphere and ocean further link through the movement

of biogeochemical nutrients. For example, iron accumulated in sea ice during winter is released to the ocean during the spring and summer melt, helping to fuel ocean productivity in the seasonal sea ice zone. Nutrient-rich sediments delivered by glaciers further connect cryosphere processes to ocean productivity.

India and Impact of IPCC Report

Four Indian coastal cities- Kolkata, Mumbai, Surat and Chennai are among 45 such coastal cities globally where even an increase of sea level by 50cm will lead to flooding. In fact, the extreme sea level events that used to happen once a century in the past will occur every year by mid-century in many regions, increasing risks for many low-lying coastal cities and small islands.

Though the IPCC doesn't release city or country-specific data in these special reports, the published scientific researches cited by it while preparing the report have some indications for Asia and south Asia region. On key takeaways for India, IPCC report noted that around 240 million people of the entire Hindu Kush Himalayan (HKH) regions — an area covering all the high mountain chains of central, south and inner Asia — would be affected due to changes in the cryosphere as it may affect the "world's largest renewable supplies of fresh water".

Some key takeaways are:

- The Hindu Kush Himalayan region (HKH) – with a population of 1.9 billion in ten major river basins will face the strongest impact across Asia. These include the Tien Shan, Kun Lun, Pamir, Hindu Kush, Karakoram, Himalayas, and Hengduan and the high-altitude Tibetan Plateau areas.
- There will be large-scale uncertainty in rainfall patterns. Floods will become more frequent and severe in the mountainous and downstream areas of the Indus, Ganges and Brahmaputra river basins, due to an increase in "extreme precipitation events."
- According to current predictions, the regional temperature is likely to increase between 3.5°C and 6°C by 2100, leading to significant losses in glacier volume, from 36 to 64 percent, depending on the warming scenario. This will impact the flow of water and its availability.
- Due to global warming and its implications in the water resources in the HKH region, three sectors would be "directly affected" – water for domestic use, agriculture and hydroelectricity.

So, the rate of risk is extremely high in the present emission scenario. But amid all these alarms there is a silver lining, provided nations scale up their collective mitigation targets and work for adaptation. Adaptation has to be part of the solution. There are many ways in which it could be done through policy changes and planning and to create climate resilient infrastructure. India can and should – take up the climate crisis as an opportunity to lead other countries in the study and development of ocean-based renewable-energy resources and energy-efficient coastal and offshore infrastructure, and capitalise on its 5,000-km coastline for green transportation.

Mitigation and Adaptation

The report's novelty lies in the near-term projections that are laid out for the period 2031-2050. This is key data to help decision-making for humankind in climate change matters. The horizon for socio-economic and infrastructure decisions tend to be on the order of decades, making the near-term projections a useful tool to serve world leaders making important decisions on oceans and/or the cryosphere. The added projections for ocean acidification and dissolved oxygen are critical for decisions on vulnerable ecosystems that comprise fisheries, aquaculture and mangroves, salt marshes and sea grasses.

The report lists strategies for achieving climate-resilience via socio-economic and ecological resilience keeping in mind the social, political and policy settings in which these strategies need to be implemented. The climate change impact mitigation and adaptation portfolio for the oceans and cryosphere include energy, carbon storage, pollution reduction, coastal vegetation, open ocean production and ocean acidification, as well as policies and governance that will demand adaptation of infrastructure to the ecosystem itself. Relocating people and economic activities may also become essential in extreme cases.

Way Forward

The just-released IPCC special report on the ocean and cryosphere in a changing climate details the immense pressure that climate change is exerting on ocean ecosystems and portrays a disastrous future for most life in the ocean and for the billions of people who depend on it unless anthropogenic greenhouse gas (GHG) emissions are slashed. The report analysed the mitigation potential and the required research, technology, and policy developments for five ocean-based mitigation areas of action: renewable energy; shipping and transport; protection and restoration of coastal and marine ecosystems; fisheries, aquaculture, and shifting diets; and carbon storage in the seabed.

The report concludes that these actions (in the right policy, investment, and technology environments) could reduce global GHG emissions by up to 4 billion tonnes of carbon dioxide equivalents in 2030 and by up to 11 billion tonnes in 2050. This could

contribute as much as 21% of the emission reduction required in 2050 to limit warming to 1.5°C and 25% for a 2°C target. Reductions of this magnitude are larger than the annual emissions from all current coal-fired power plants worldwide.

Considering each action area through a technical, economic, and social/political lens, the report concluded that carbon storage in the seabed requires considerable further investigation to address concerns regarding the impacts on deep ocean environments and ecosystems, but that the other four ocean-based sectors have substantial mitigation potential and could be readily implemented or initiated with the right policies, incentives, and guidance

General Studies Paper- III

Topic: Conservation, environmental pollution and degradation, environmental impact assessment.

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7. NORTH INDIA RIVER SYSTEM : IMPERATIVE FOR FLOOD MANAGEMENT

Why in News?

Ganga and other rivers have swelled up due to heavy rains in the North Indian states. More than 100 people have died due to flooding caused by heavy rains in these states.

Introduction

Flows in rivers, including those categorised as high flows, can be both beneficial and catastrophic for human life and economy. A river needs to flow in order to perform its ecological processes that provide various ecosystem services to humans and nature. High flows, in particular, are critical for maintaining and restoring many of the ecosystem services provided by rivers. The Ganga system is one of the largest Himalayan fluvial systems that experience high flows of varying magnitude during monsoon. During the monsoon months, the river carries large volumes of water along with heavy load of silt, nutrients and associated constituents that cause floods in several North Indian states such as Eastern Uttar Pradesh, Bihar among others. The flooding problem is mainly confined to the middle and lower parts of the Ganga basin.

High flows in the basin are mainly caused by the setting in of 'break' situations in the monsoon, which gets accentuated with cyclone followed by intense rainfall. At present, there is inadequate protection against floods in the basin due to the absence of mitigation and non-structural flood protection measures, coupled with poor understanding of the geomorphic, hydrologic, and hydraulic processes that control channel shape, size, and gradient of the river which is a prerequisite to successful implementation of flood management schemes. This calls for reconsideration of the existing flood management approach in favour of more sustainable and resilient solutions. While still necessary, traditional engineering works cannot provide absolute protection and need to be modified to achieve more flexible flood protection and mitigation solutions.

The Ganga River System: An overview

The Ganga is joined by a number of tributaries which follow the topography and the slope of the terrain. In the Upper Ganga, all the tributaries like Bhagirathi, Alakananda, Ramganga, Yamuna and Ghaghara follow a North West-South East (NW-SE) course that is consistent with the topography. The common features of the non-mountainous tributaries, including the Ramganga, include braided and meandering channels, sandy shoals that often experience inundation during the monsoon, and wide floodplains.

The drainage pattern is predominantly dendritic. In middle Ganga Plains, the tributaries – Son, Gandak, Kosi and their tributaries, along with the Rapti, the Ghaghara and the main stream of the Ganga, tend to spill over in the monsoon and are dynamic.

Flooding in the Ganga River System

The rivers of the system are mostly perennial in nature, especially the ones that originate in the Himalayas. The water in these rivers is derived from the melting of Himalayan glaciers, the snow melt of the winter, and the monsoonal rainfall during the summer. Monsoon high flows in the basin drained by the system, are caused when concentrated rainfall occurs over a significant period of time. This leads to the generation of flood run-off within the area that experiences precipitation. Most often, these rainfalls occur during the summer months (June to September) and are associated with the movement of monsoon depressions and cyclones.

This rainfall contributes to the flood runoff in the catchment of the rivers of North-east and the Central Himalayas. This is primarily responsible for contributing to the high flows in

the leftbank tributaries of the Ganga in Eastern UP and North Bihar. The frequency of floods is high in the Gauge/Discharge (G/D) sites along the left bank tributaries of the Ganga in Uttar Pradesh and Bihar, as well as the mainstream of Ganga between Ballia in Eastern Uttar Pradesh and Farakka in West Bengal. This is evident from the flood frequencies at various G/D sites of left bank rivers like Ghaghara, Burhi Gandak, Baghmati, the Adhwara Group of rivers, Kamla Balan, Kosi and Mahananda. The Kosi basin experiences frequent flooding. Kosi, along with Ghaghra have large catchment areas which are shared between India, Nepal and China. Among the rivers that have relatively smaller basins and originate from the foothills of the Himalayas, Kamla Balan and Baghmati experience more frequent flooding.

Major Causes of Flood in Ganga River System

Meteorological causes: The characteristics of rainfall determine the characteristics of floods. High-magnitude rainfall is the most common cause of flood. Excessive rainfall during the monsoon season is associated with (i) monsoon depressions and cyclonic storms originating over the Bay of Bengal and the adjoining coastal belt and Arabian Sea. (ii) orographic lifting along mountain barriers and (iii) break in the monsoon.

Geomorphic causes: Geomorphic causes include channel migration, meandering growth, avulsion and natural changes in the elevation of channel bed. These factors may cause the flood to occur in unexpected areas. In addition to these, landslides and surging glaciers can block rivers that cause massive floods when they fail such floods are common in many parts of the Himalayan and sub-Himalayan regions.

Anthropogenic causes: Within the last century anthropogenic effects on riverine environment have become more intrusive. Construction of dams, barrages, embankments and other engineering works has not only modified the natural behavior of the rivers, but has also added a new dimension to the problem of flooding.

Apart from the above situations, the following factors also play an important role in augmenting floods in the river basins:-

- Indiscriminate destruction of forest and vegetal cover in the upper reaches of a river.
- Removal of vegetation from the hilly slopes or over grazing by the domestic animals.
- Deposition of silt washed down from bare and poorly covered hill slopes in the upper reaches of a river, man-made obstructions to the free flow or rivers like bridges, embankments, etc.
- Improper agricultural practices like shifting cultivation etc. and failure of dams and artificial lakes created by advancing glacier tongues or land slides.

Floods and their Socio-Economic Impacts

Floods are among the major disasters in India, causing economic losses of more than $7 billion annually. The global assessment report (GAR) 2015 calls on the country to invest in Disaster Risk Reduction (DRR) and make investments for flood-resilient infrastructure. Apart from innumerable social problems caused by floods, challenges for food security emerge as an important implication of the bank erosion and river migration in the region. Over 60,000 people are displaced each year due to riverbank erosion along the major rivers of the Ganga delta.

The Indian state of Bihar is shown to have maximum losses as most of the assets and the population in this state are in flood prone areas. The second most severely affected state in India is Uttar Pradesh (UP). It comprises almost all the sub-basins of the Ganges, i.e., Betwa, Chambal, Gandak, Ghagra, Gomti, Ken, Lower Ganges, Middle Ganges, Ramganga, Sind, Sone, Tons, Upper Ganges, and Yamuna. While Ghagra and Middle Ganges sub-basins have the maximum share in losses and flood affected persons in Uttar Pradesh.

Flood Management Challenges for India

Despite the various steps undertaken over the last six decades, the trend of increasing damage and devastation brought by floods continues to pose a challenge to the government. Over time, several expert committees have reviewed the progress of engineering works in controlling floods. These committees also suggested river flow modulation to meet competing demands for water from agriculture, urban, industry and energy sectors. It is now well-realised in the policy circles that floods cannot be controlled entirely through structural measures; that they have to be managed in order to minimise the damages caused by catastrophic flood events.

In this respect, flood plain mapping and zoning have been initiated, but, so far, integration of flood monitoring and mapping into existing flood management has not succeeded. Methods of flood relief, such as early flood warning systems and flood recovery measures, have not been effectively implemented. An adequate combination of structural and non-structural flood protection measures, together with damage mitigation measures need to be included in the flood management approach. Likewise, sediment management has also been a challenge that has not been adequately addressed in the policy arena. The draft policy on sediment management (2017), prepared by the Ministry of Water Resources, River Development

and Ganga Rejuvenation identifies the importance of lateral connectivity of river with its flood plain as an important component of sediment management. It emphasises constructing sluice gates along stretches of embankments that would allow the sediment to be deposited on the floodplains and also contribute to the various provisioning services of floods like the recharge of groundwater and rejuvenation of water bodies.

A New Perspective to Flood Management

Big floods are seen as natural catastrophic events, causing large-scale damage to life and property. However, flood-related losses can be reduced through an adequate combination of structural and non-structural flood protection measures, together with damage mitigation measures included in the Integrated Flood Management (IFM) approach. The IFM approach derives its principles from the Integrated Water Resources Management (IWRM) approach and integrates land use management, and risk management. Where it considers restoring and maintaining comprehensive environmental flows (e-flows) in a river basin as one of the keystones to implementing an integrated management of water resources.

IFM as a new approach that has emerged in recent years in dealing and living with floods. While structural measures for flood protection are necessary for the protection of both existing settlements and new developments, mitigation and non-structural flood protection measures tend to be more sustainable. The approach rests on six key elements:

(i) Managing water cycle as a whole;

(ii) Integrating land and water management;

(iii) Managing risk and uncertainty especially exacerbated in flood management due to climate change;

(iv) Adopting the best combination of flood protection measures and options;

(v) Ensuring participatory approach by involving all relevant stakeholders in decision-making process, and

(vi) Integrating flood associated hazards into broader hazard management approach.

A successful IFM implementation requires inputs from different stakeholders including government, public, technical and management and coordination at all levels of authority within the basin and between sectors. The approach stresses on:

- Local and community capacity building as necessary to meet the IFM requirements.
- Sharing and management of information as a precondition for an efficient IFM approach. In the case of transboundary rivers like Ganga, the exchange of flood data is necessary for the implementation of a flood preparedness plan for downstream riparian countries.
- Involvement of various sectors in the decision-making process. Unfortunately, this approach, so far, has not been fully adopted in India.

Conclusion

Recurring floods have historically been understood as a technological problem that requires techno-centric solutions such as diversion of river flow and construction of river embankments. Embankments, however, have been found to cause sediment deposition in riverbeds, increasing the risk of embankment breach and flooding even during normal-flow stages. Floods continue to occur and displace millions of families in the Ganga basin.

The consequences of floods can be minimised by management practices that are based on the principles of IFM of multi-level governance, management that is adaptive in nature, accounts for multiple interest within the flood management process and is aimed at increasing or restoring ecological services of riverine ecosystem.

Further, stronger political will is needed to implement hard measures like flood-plain zoning that would even result in displacing and dislocating people in the short term, only to prevent them from the agonies of flood in the long term.

General Studies Paper- III

Topic: Disaster and disaster management.

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SEVEN SUBJECTIVE QUESTIONS WITH MODEL ANSWERS

Father of the Nation @ 150 : Still Alive in Our Blood

Q 1. More than ever before, Mahatma Gandhiji's teachings are valid today, when people are trying to find solutions to the rampant greed, widespread violence and runaway consumptive style of living. Elaborate.

Hints:

- It has been seventy years since Mahatma Gandhi departed from our midst. But his life and soul continue to animate humanity transcending national and international boundaries. His contribution to human development is far too great and varied to have been forgotten or to be overlooked. The world today recognizes him as a far more compelling social innovator than humanity ever realized.
- Gandhiji's philosophy of inclusive growth is fundamental to the building of a resurgent rural India. He believed in "production by the masses" rather than in mass production, a distinctive feature of the industrial revolution. Gandhi envisaged villages as self-sufficient republics. He knew that India lived in its villages, which is why he stressed on the growth of the rural economy such as khadi, handloom, handicraft and sericulture.
- In recent years, we have witnessed terrorist violence affecting almost all countries. Even the so called advanced, affluent nations suffer from the menace of terrorist violence. Today, people are divided not only on economic basis but also on national, regional and religious basis. The situation demands that non-violent techniques as a means of social change are put into practice immediately. Gandhiji held that violence was wrong as a matter of principle.
- The focus of 21st century is on sustainable development. By definition, sustainable development is the development of the present generation without compromising the abilities of future generations. Though the concept of sustainable development was alien to Gandhi, his constructive programmes were the first expressions of such a development without destroying nature and natural environment.

Issue of Prioritising a Language in Multi-lingual India

Q 2. "Language, used as a political weapon, can be divisive and chauvinistic". Critically discuss.

Hints:

- Language as a potential ground for identity, power, unity and integrity has been the subject of debate among different political parties and linguistic groups in India for a considerable period of time.
- The problem we faced at the time of drafting the Constitution, as we face even today, is that the approach towards linguistic policy seems to be driven more by the politics of identity than values of aspiration or accommodation.
- Language, used as a political weapon, can be divisive and chauvinistic. It can be used to create hierarchical identities and unequal power dynamics. When we look at languages primarily as markers of identities, we build barriers to acceptability. People begin to assert linguistic supremacy, resist learning a language which they perhaps would not have objected to otherwise.
- It is essential to move the discussion away from the binaries of Hindi and non-Hindi camps. The issue which merits attention is the manner in which linguistic policies ought to be designed in a multicultural society. The linguistic diversity that India has to negotiate is without precedent. We started off on a wrong foot at the time of Independence by confining language as an issue of identity. We must learn to avoid the same pitfalls which have damaged our polity so deeply.

One Nation, One Ration Card : Nation-wide Portability of Ration Card

Q 3. What do you understand by 'one nation, one ration card'? Along with its proposed benefits, discuss issues and challenges related to it.

Hints:

- The ONORC entails integration of the existing PDS systems or portals of states and UTs with those of the

Centre under a central repository of all National Food Security Act (NFSA) ration cards and beneficiaries. Any beneficiary, anywhere in the country, will be able to pick up their grain from any public distribution system of their choice after 30th June, 2020

- ONORC is a gamechanger because it makes their rations "portable", allowing them to pick up foodgrains from any ration shop in the country. It also benefits non-migrants by allowing them to transact at better-performing shops locally. This local "choice effect" is extremely popular in Andhra Pradesh, which has introduced such portability within the state since October 2015.
- The first relates to the amenability of ONORC for migrants. Identification of beneficiaries is transaction-cost heavy and is fraught with several inclusion and exclusion errors. If a household moves, to become eligible, the costs must be incurred all over again.
- Further, there is widespread denial of entitlement, with households not getting the quantity or paying the price that they are entitled to.

Implications of PM Modi's Speech in UNGA

Q 4. Discuss the implications of PM Modi's Speech in UNGA.

Hints:

- Apart from terrrorism, he also spoke on a host of issues ranging from climate protection and global peace to his government's efforts at helping the marginalised. PM Modi also spoke about his government's various welfare schemes that "gave the world a new hope" for a better tomorrow.
- Noting that India is a country, that has given the world, not war, but Buddha, "Yuddh nahi, buddh" and Buddha's message of peace. He also emphasised that the onus of combating terrorism should not fall on any single country alone but for the entire world and humanity.
- PM Modi said the world is celebrating the 150th birth anniversary of Mahatma Gandhi, whose message of truth and non-violence is very relevant for us even today, for peace, development and progress in the world.
- Prime Minister urged the international community to give a new direction to multilateralism. He said as the world is going through a new era, the countries do not have the option to confine themselves within their boundaries. Modern technology in the 21st Century, is bringing about sweeping changes in social life, personal life, economy, security, connectivity and international relations. In such a situation, a fragmented world, is in the interest of no one.
- In his speech PM Modi stressed on India's many global contributions that held lessons for other nations, rather than allowing himself to be limited by regional matters.
- Prime Minister Narendra Modi's speech at the 74th session of United Nations General Assembly (UNGA), detailing outlines to build an inclusive, assertive and accountable world, has not only made a global impact but has also enhanced India's stature on the world stage. Further, it implies that India is an example to the world and the world could seek motivation from the developing country.

Quantum Supremacy : Next Era of Computational Evolution

Q 5. What is 'Quantum Supremacy'? Researchers called it a milestone towards full scale quantum computing. Discuss.

Hints:

- Quantum supremacy refers to a quantum computer solving a problem that cannot be expected of a classical computer in a normal lifetime. This relates to the speed at which a quantum computer performs.
- In principle, even the simplest universal computer can solve anything that is computable given infinite time to do so. So, "supremacy" is a matter of how quickly and reliably a computer can solve a problem. The purpose is to built a quantum device that can do at least one thing which is outside the reach of classical machines.
- It is generally believed that at least 49 qubits are required to cross the quantum supremacy line. Qubits behave very differently to bits in classical computers. Bits represent either a "1" or a "0," and computers read and perform operations on one bit at a time. In contrast, qubits can represent a combination state made up of both "1" and "0," due to the peculiar quantum effects in which properties like particle position, direction, and momentum are not well-defined. This allows for a system to be in multiple states at the same time, called quantum indeterminacy.
- It could take quite a few years for quantum computers to achieve their full potential. Universities and businesses working on them are facing a shortage of skilled researchers in the field—and a lack of suppliers

of some key components. But if these exotic new computing machines live up to their promise, they could transform entire industries and turbocharge global innovation.

The Ocean and Cryosphere in a Changing Climate : IPCC Report

Q 6. "Climate change affecting world's ocean ecosystem." Discuss it in the context of recently released report of IPCC on Oceans and Cryosphere.

Hints:

- Over the last decades, global warming has led to widespread shrinking of the cryosphere, with mass loss from ice sheets and glaciers, reductions in snow cover and Arctic sea ice extent and thickness, and increased permafrost temperature.
- Global mean sea level (GMSL) is rising, cryospheric and associated hydrological changes have impacted terrestrial and freshwater species and ecosystems, coastal ecosystems are affected by ocean warming, including intensified marine heatwaves, acidification, loss of oxygen, salinity intrusion and sea level rise, in combination with adverse effects from human activities on ocean and land.
- Glaciers could lose a fifth of their mass this century if emissions are low, and more than 80% in regions such as Central Europe.
- Warming could “drastically alter” migration flows. If emissions are high, some island nations are “likely” to become “uninhabitable” this century.
- The just-released IPCC special report on the ocean and cryosphere in a changing climate details the immense pressure that climate change is exerting on ocean ecosystems and portrays a disastrous future for most life in the ocean and for the billions of people who depend on it unless anthropogenic greenhouse gas (GHG) emissions are slashed.

North India River System : Imperative for Flood Management

Q 7. Discuss the reasons behind the freequent number of floods in the Northern India.

Hints:

- Ganga and other rivers have swelled up due to heavy rains in the North Indian states. More than 100 people have died due to flooding caused by heavy rains in these states.
- **Meteorological causes:** The characteristics of rainfall determine the characteristics of floods. High-magnitude rainfall is the most common cause of flood.
- **Geomorphic causes:** Geomorphic causes include channel migration, meandering growth, avulsion and natural changes in the elevation of channel bed. These factors may cause the flood to occur in unexpected areas. In addition to these, landslides and surging glaciers can block rivers that cause massive floods when they fail such floods are common in many parts of the Himalayan and sub-Himalayan regions.
- **Anthropogenic causes:** Within the last century anthropogenic effects on riverine environment have become more intrusive. Construction of dams, barrages, embankments and other engineering works has not only modified the natural behavior of the rivers, but has also added a new dimension to the problem of flooding.
- Deposition of silt washed down from bare and poorly covered hill slopes in the upper reaches of a river, man-made obstructions to the free flow or rivers like bridges, embankments, etc.
- Improper agricultural practices like shifting cultivation etc. and failure of dams and artificial lakes created by advancing glacier tongues or land slides.

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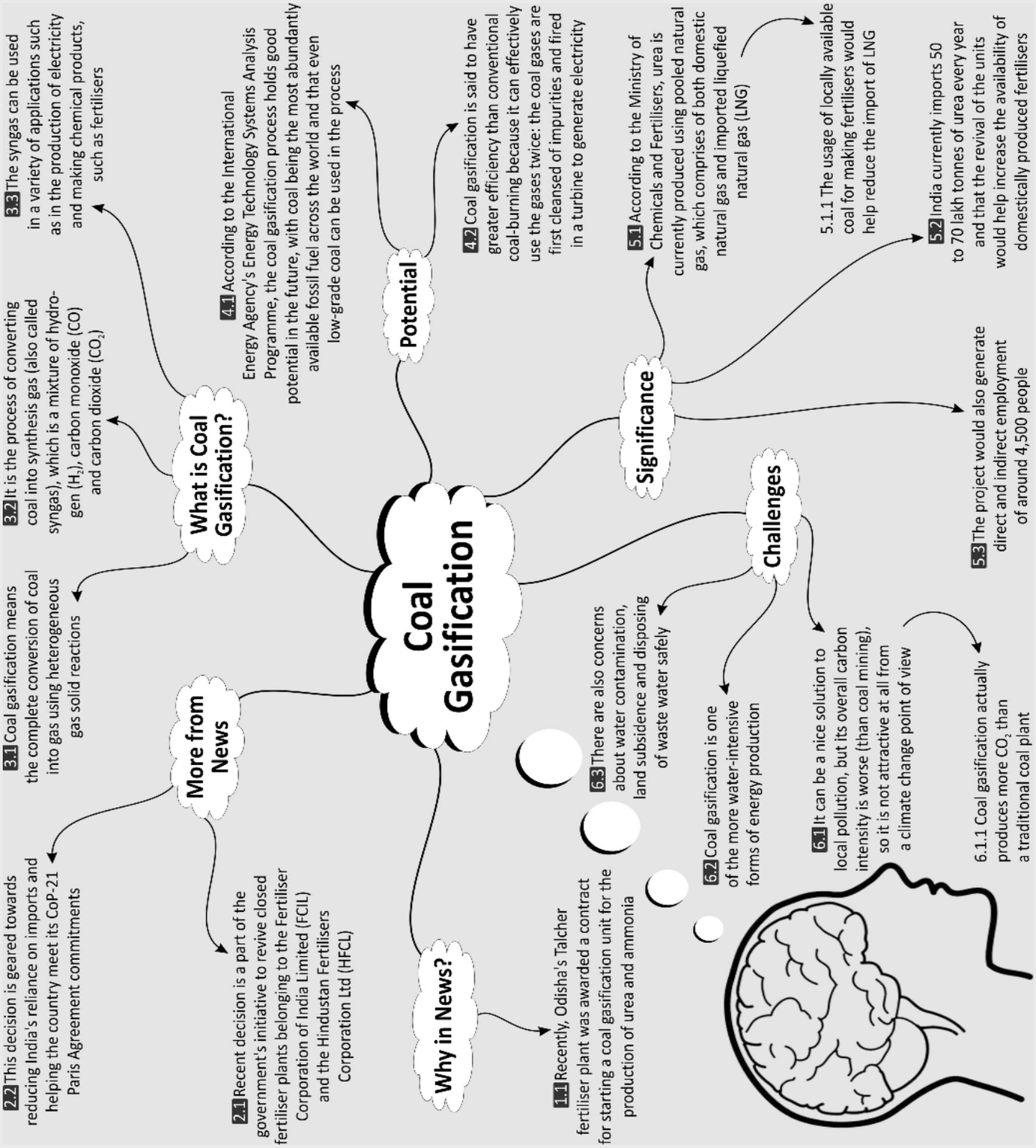
SEVEN BRAIN BOOSTERS



Emissions Trading Scheme

Introduction

2.2 Along with the Gujarat Pollution Control Board (GPCB), it was designed by the Energy Policy Institute at the University of Chicago (EPIC), the Economic Growth Center at Yale University and others from The Abdul Latif Jameel Poverty Action Lab (J-PAL)

2.1 The programme is a market-based system where the government sets a cap on emissions and allows industries to buy and sell permits to stay below the cap

About ETS

3.2 Under ETS, the regulator will initially allocate each plant a fixed number of permits that would earmark the quantum of emissions the plant is permitted

3.2.1 Since the total number of permits is fixed, the total volume of polluting emissions is also fixed

3.2.2 This is being done to ensure that the quality of air is maintained and peoples' health is protected

3.3 Once the industrial units are given an initial allocation, they have the freedom to buy or sell these permits

3.3.2 Likewise, plants that find it very expensive to reduce emissions can choose to buy these permits

3.3.1 This means that those industries that can reduce emissions to below their permissible limits can sell their excess permits to other factories

3.1.1 In other words, ETS is a market in which the traded commodity is particulate matter emissions

3.1 ETS is a regulatory tool that is aimed at reducing the pollution load in an area and at the same time minimising the cost of compliance for the industry

Why in News?

1.2 The pilot programme was put in place in the city of Surat

1.1 Gujarat government has launched India's first trading programme 'Emissions Trading Scheme (ETS)' to combat particulate air pollution

Why Surat?

4.1 In the last five years, the quality of air in Surat has deteriorated because of densely populated industrial belt

4.2 In 2013, when the project was conceptualised, the PM10 level in Surat was 86 micrograms per cubic metre (µg/cu. m)

4.3 Further, pollution levels have increased between 120-220 per cent, with PM10 in 2018 reaching 189 µg/cu. m

4.4 Surat was chosen because it had already installed Continuous Emission Monitoring Systems, which makes it possible to estimate the mass of particulate matter being released

4.4.1 The new scheme will take advantage of this technology's modern, transparent approach to monitoring

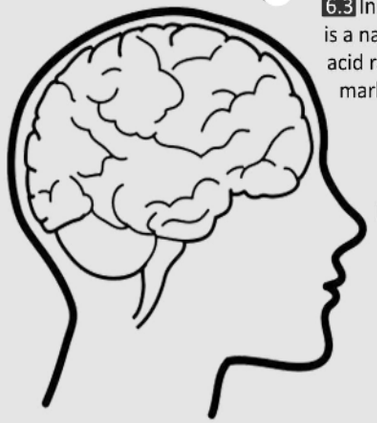
Global Experience

6.4 India also has a scheme run by the Bureau of Energy Efficiency that enables trading in energy units

6.3 In the United States there is a national market to reduce acid rain and several regional markets in nitrogen oxides

6.2 The European Union's Emission Trading System is for greenhouse gas emission

6.1 The carbon development mechanism (CDM) under the 'Kyoto Protocol' allowed trade in 'carbon credits'



Proposed Benefits

5.1 ETS would reduce the expenses that manufacturing units would incur for reducing pollution, as well as make it very difficult for them to violate regulations

5.1.1 Both these factors would help ensure compliance and thereby reduction of pollution

5.2 If this pilot project is successful, it would give the country an opportunity to scale up emissions itrading, thereby reducing industrial pollution

Hyperloop

Introduction

2.1 The hyperloop trains will run from BKC in Mumbai to Wakad in Pune, covering a distance of 117.5 km, at a speed of 496 kmph and cover the distance in just 23 minutes

2.2 The hyperloop corridor will be built either under the Mumbai-Pune Expressway or run parallel

What is Hyperloop?

3.1 Hyperloop envisages magnetically levitating pods or capsules travelling at high speeds through low-pressure tubes erected on columns or tunneled underground

3.2 The system is fully autonomous and sealed, so no driver-related error is anticipated

3.3 In a sealed environment with almost no air resistance, the pods are expected to reach very high speeds, there by potentially reducing transport time by more than 80%

Why in News?

1.1 The government of Maharashtra has approved the Virgin Hyperloop One-DP World consortium as the 'Original Project Proponent' for the Pune-Mumbai hyperloop project

Pros

4.1 There are approximately 75 million passenger journeys between Mumbai and Pune annually, which is expected to skyrocket to 130 million by 2026

4.1.1 This system can meet this growing demand by supporting as many as 200 million passengers annually

4.2 It can draw power from multiple energy sources; can be even 100% carbon free if the source is wind or solar

4.3 A new, alternate transportation method

4.4 It could promote 'Make in India' programme and manufacturing sector of India by technology transfer and sourcing the necessary material locally

4.5 If successful, such plans would enable India to jump forward in its transport infrastructure and could revolutionise the way business is conducted

Cons

5.1 Hyperloop is so far only a concept with no resemblance to any public transport system known to man

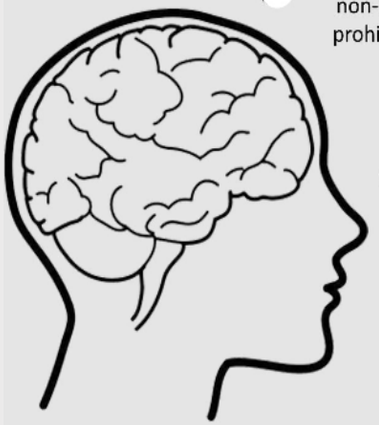
5.2 In a country like India, where railway infrastructure is abysmal and the airline industry is priced beyond the abilities of most of the populace

5.2.1 The practical benefits of a Mumbai-Pune Hyperloop that would justify resource requirements aren't clear yet

5.3 It requires heavy investments therefore effective public and private sector coordination is a prerequisite

5.4 It may prove to be non-inclusive way of transport-prohibitive for the economically marginalized people

5.5 Further, land acquisition for system will be one of the largest challenges in India



Project NETRA

Why in News?

1.1 The Indian Space Research Organisation (ISRO) has initiated 'Project NETRA (Network for space object Tracking and Analysis)' – an early warning system in space to detect debris and other hazards to Indian satellites

About Project

2.1 The Project will give India its own capability in space situational awareness (SSA) like the other space powers — which is used to 'predict' threats from debris to Indian satellites

2.2 It also goes so far as to serve as an unstated warning against missile or space attack for the country

2.3 NETRA's eventual goal is to capture the Geostationary Earth Orbit (GEO), scene at 36,000 km where communication satellites operate

2.3.1 Initially, SSA will be for Low-Earth Orbits (LEO) which have remote-sensing spacecraft

2.4 Under NETRA, the ISRO is planning to put up many observational facilities: connected radars, telescopes; data processing units and a control centre

2.4.1 They can, among others, spot, track and catalogue objects as small as 10 cm, up to a range of 3,400 km and equal to a space orbit of around 2,000 km

2.5 In order to achieve high-precision, along with long range telescope in Leh and a radar in the North East, ISRO will also use the Multi-Object Tracking Radar (MOTR) to get a broad SSA picture

Significance

3.1 The project would make India a part of international efforts towards tracking, warning about and mitigating space debris

3.2 It will improve India's space situational awareness and allow it to become self-dependent

3.2.1 It will ensure that India will no longer have to depend on data from the North America Aerospace Defence Command (NORAD)

3.2.1.1 NORAD is an initiative of the US and Canada that shares selective debris data with many countries

What is Space Debris?

4.1 Space debris could be floating particles from dead satellites or rocket parts that stay in orbit for many years

4.2 Satellite agencies agonise over even a speck of paint or fragment floating towards their spacecraft

4.2.1 It disables on board electronics and cripples the satellite worth several hundred crore rupees besides many services that run on it

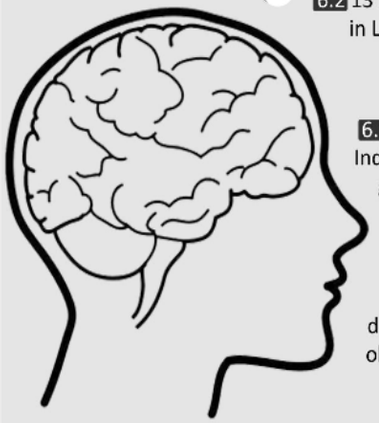
4.3 Agencies constantly look for debris at the time of a launch and through the life of a satellite

Facts

6.1 Currently there are 15 functional Indian communication satellites in the geostationary orbit of 36,000 km

6.2 13 remote sensing satellites in LEO of up to 2,000 km

6.3 And eight navigation satellites in medium Earth orbits



About Space Situational and Awareness Centre

5.1 ISRO has set up the Space Situational Awareness Control Centre in Bengaluru

5.2 It hosts a range of activities related to the protection of Indian space assets from inactive satellites, pieces of orbiting objects, near Earth asteroids and adverse space weather conditions

5.3 It also assimilates the tracking data of inactive satellites from indigenous observation facilities and generates useful information from bare observations through analysis

UN Climate Action Summit 2019

More from News

2.1 UN Secretary-General, Antonio Guterres has asked countries to bring their action plans by 2020, in line with the objective of reducing global greenhouse gas emissions by 45% by 2030 and to net zero by 2050

2.2 The latest analysis shows that if we act now, we can reduce carbon emissions within 12 years and hold the increase in the global average temperature to well below 2°C and 1.5°C above pre-industrial levels

2.3 India has declared programme of scaling up electricity from renewable sources to 175 GW by 2022 and even to 450 GW later

Concerns

3.1 Global emissions are reaching record levels and show no sign of peaking

3.2 The last four years were the four hottest on record, and winter temperatures in the Arctic have risenby 3°C since 1990

3.3 Climate change is disrupting national economies, costing us dearly today and even more tomorrow

3.4 The impacts of climate change are being felt everywhere and are having very real consequences on people's lives

Why in News?

1.1 The United Nations (UN) Climate Action Summit 2019 was held recently in the United States of America (USA)

1.2 It was organised to boost action to implement the 'Paris Agreement', which was signed in 2015

Action Portfolios

4.1 The summit has prioritized nine action portfolios, out of nine, six action portfolios are discussed here:

4.1.1 **Finance**: mobilizing public and private sources of finance to drive decarbonization of all priority sectors and advance resilience

4.1.2 **Energy transition**: accelerating the shift away from fossil fuels and towards renewable energy, as well as making significant gains in energy efficiency

4.1.3 **Industry transition**: transforming industries such as oil and gas, steel, cement, chemicals and information technology

4.1.4 **Nature-based solutions**: reducing emissions, increasing sink capacity and enhancing resilience within and across forestry, agriculture, oceans and food systems, including through biodiversity conservation, leveraging supply chains and technology

4.1.5 **Cities and local action**: advancing mitigation and resilience at urban and local levels, with a focus on new commitments on low-emission buildings, mass transport and urban infrastructure; and resilience for the urban poor

4.1.6 **Resilience and adaptation**: advancing global efforts to address and manage the impacts and risks of climate change, particularly in those communities and nations most vulnerable

Three Additional Key Areas

5.1 **Mitigation strategy**: to generate momentum for ambitious Nationally Determined Contributions (NDCs) and long-term strategies to achieve the goals of the 'Paris Agreement'

5.2 **Youth engagement and public mobilization**: to mobilize people worldwide to take action on climate change and ensure that young people are integrated

5.3 **Social and political drivers**: to advance commitments in areas that affect people's well-being, such as reducing air pollution, generating decent jobs and strengthening climate adaptation strategies

'TB Harega Desh Jeetega' Campaign

Why in News?

1.1 Union Minister for Health and Family Welfare has launched the new 'TB Harega Desh Jeetega' campaign for ending TB by 2025

1.2 He also released the 'National TB Prevalence Survey' and 'TB India Report 2019'

About Campaign

2.1 The new TB campaign aims to improve and expand the reach of TB care services across the country, by 2022

2.2 The major three strong pillars of the campaign are clinical approach, public health component and active community participation

2.3 Other supporting elements of the campaign comprise private sector engagement, patient support and political and administrative commitment at all levels

About National TB Prevalence Survey

3.1 Around 25 vans will be part of the prevalence survey, which will take 6 months and be carried out across the country

3.2 It will present national and state level data, which will be used as a policy tool for further interventions

About TB Report 2019

4.1 India accounted for a quarter of the Global TB burden with an estimated 27 lakh new cases in the year

4.2 Moreover, notifications from private sector health care providers reached 5.4 lakhs, an increase of 40%, contributing to 25% of all TB notifications

4.2.1 Among the notified, treatment was initiated for about 19.1 lakh cases (90%) across both public and private sectors

4.3 The majority of the affected individuals (89%) were in the age group 15-69

4.4 Uttar Pradesh has reported 4.2 lakh cases, accounting for 20% of all notifications (187 cases/lakh population)

4.5 Haryana saw a large increase in the number of cases in between 2017-2018

4.6 On the other hand, Odisha witnessed a decline in the number of notified cases from over 67,000 in 2017 to 50,244 in 2018, or about 25%

4.7 The Union Territories (UTs) of Lakshadweep and Andaman & Nicobar Islands too witnessed a drop

4.8 The two UTs of Delhi and Chandigarh had the highest number of notified patients per lakh population at 417 and 468 respectively

4.9 Further, TB is the leading cause of morbidity and mortality among people living with HIV

4.9.1 Nearly 25% of all deaths among people living with HIV are estimated to be due to TB

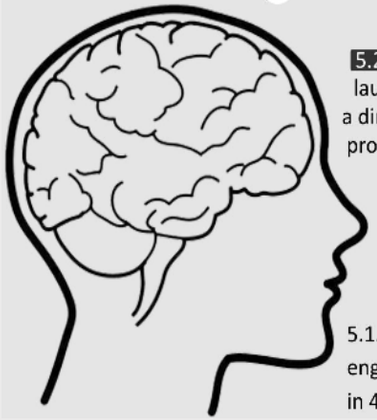
Government Initiatives

5.1 The government of India has partnered with the Global Fund to launch 'Joint Effort for Elimination of TB' (JEET)

5.1.1 It is a private sector engagement program operating in 45 cities across the country

5.2 In April 2018, the government has launched the 'Nikshay Poshan Yojana', a direct benefit transfer (DBT) scheme to provide nutritional support (Rs. 500 per month for the entire duration of treatment) to TB patients

5.3 Recently, the government has launched an all oral regimen kit for multi-drug resistant TB patients which does not include injections which are painful and can have side effects



The Idea of Regional Supreme Court Benches

Why in News?

1.1 Recently, Vice-President M. Venkaiah Naidu has suggested that the Supreme Court (SC) institute four regional Benches to tackle the enormous backlog of cases and to ensure their speedy disposal

1.2 Naidu also endorsed the recommendation of the Law Commission of India that the top court should be split into two divisions

Background

2.1 In 1984, the Tenth Law Commission of India (95th Report) recommended that the SC of India should consist of two Divisions, namely Constitutional Division and Legal Division

2.2 In 1988, the Eleventh Law Commission (125th Report) reiterated that the recommendation for splitting the SC into two halves deserves to be implemented

2.3 Thereafter, in 2009, the Eighteenth Law Commission (229th Report) recommended that a Constitution Bench be set up at Delhi to deal with constitutional and other allied issues

2.3.1 And four Cassation Benches be set up in the Northern region/ zone at Delhi, the Southern region/ zone at Chennai/ Hyderabad, the Eastern region/zone at Kolkata and the Western region/zone at Mumbai

Issue of Backlog Cases

3.1 In the early decades, SC functioned largely as a constitutional court, with some 70-80 judgments being delivered every year by Constitution Benches of five or more judges

3.1.1 This number has now come down to 10-12

3.2 Due to their heavy workload, judges mostly sit in two- or three-judge Benches to dispose of all kinds of cases; these include several non- Constitutional and relatively petty matters

3.3 This heavy workload is due to the fact that India's Supreme Court is perhaps the world's most powerful court, with a very wide jurisdiction

3.4 The result is more than 65,000 cases are pending in the Supreme Court, and disposal of appeals takes many years

3.4.1 Several cases involving the interpretation of the Constitution by five or seven judges have been pending for years

Arguments in favour

4.1 As per 229th report of Law Commission, there is a dire search for solution for the unbearable load of arrears under which SC is functioning as well as the unbearable cost of litigation for those living in far-flung areas of the country

4.2 Standing Committees of Parliament recommended in 2004, 2005 and 2006 that Benches of the SC be set up elsewhere

4.3 SC Rules also give the Chief Justice of India the power to constitute Benches — he can, for instance, have a Constitution Bench of seven judges in New Delhi, and set up smaller Benches in, say, four or six places across the country

4.4 According to the experts, this arrangement does not require any amendment to the Article 130 of the Indian Constitution

4.4.1 Article 130 of the Indian Constitution says that "the Supreme Court shall sit in Delhi or in such other place or places, as the Chief Justice of India may, with the approval of the President, from time to time, appoint"

Supreme Court's View

5.1 In 2008, the Committee suggested that at least one Bench be set up on a trial basis in Chennai

5.1.1 But the SC has not agreed with the proposal, which in its opinion will dilute the prestige of the court and dividing the SC would affect the country's unitary character

SEVEN MCQ's WITH EXPLANATORY ANSWERS (Based on Brain Boosters)

Coal Gasification

Q1. Consider the following statements in respect of 'coal gasification':

1. It is the process of converting coal into synthesis gas (also called syngas), which is a mixture of hydrogen (H_2), carbon monoxide (CO) and methane (CH_4).
2. The syngas can be used in a variety of applications such as in the production of electricity and making chemical products, such as fertilisers.

Which of the statements given above is/are correct?

a) 1 only b) 2 only

c) Both 1 and 2 d) Neither 1 nor 2

Answer: (b)

Explanation: Statement 1 is not correct. Coal gasification means the complete conversion of coal into gas using heterogeneous gas solid reactions. It is the process of converting coal into synthesis gas (also called syngas), which is a mixture of hydrogen (H_2), carbon monoxide (CO) and carbon dioxide (CO_2).

Statement 2 is correct. The syngas can be used in a variety of applications such as in the production of electricity and making chemical products, such as fertilisers.

Emissions Trading Scheme

Q2. Consider the following statements in respect of 'Emissions Trading Scheme (ETS)':

1. ETS is a market in which the traded commodity is particulate matter emissions.
2. It is a market-based system where the government sets a cap on emissions and allows industries to buy and sell permits to stay below the cap.
3. It aimed at reducing the pollution load in an area and at the same time minimising the cost of compliance for the industry.

Which of the statements given above is/are correct?

a) 1 and 2 only b) 2 and 3 only

c) 1 and 3 only d) 1, 2 and 3

Answer: (d)

Explanation: All statements are correct. Gujarat government has launched India's first trading programme 'Emissions Trading Scheme (ETS)' to combat particulate air pollution. It is a market in which the traded commodity is particulate matter emissions.

The programme is a market-based system where the government sets a cap on emissions and allows industries to buy and sell permits to stay below the cap.

ETS is a regulatory tool that is aimed at reducing the pollution load in an area and at the same time minimising the cost of compliance for the industry.

Hyperloop

Q3. Consider the following statements in respect of 'hyperloop':

1. It is a system where magnetically levitating capsules are sent at high speeds through high-pressure tubes.
2. In India, the hyperloop corridor will be built between Mumbai and Bangalore.

Which of the statements given above is/are correct?

a) 1 only b) 2 only

c) Both 1 and 2 d) Neither 1 nor 2

Answer: (d)

Explanation: Both statements are incorrect. Hyperloop envisages magnetically levitating pods or capsules travelling at high speeds through low-pressure tubes erected on columns or tunneled underground.

In India, the hyperloop trains will run from BKC in Mumbai to Wakad in Pune, covering a distance of 117.5 km, at a speed of 496 kmph and cover the distance in just 23 minutes.

Project NETRA

Q4. Consider the following statements in respect of 'Project NETRA':

1. It will give India its own capability in space situational awareness (SSA) to 'predict' threats from debris to Indian satellites.

2. It also goes so far as to serve as an unstated warning against missile or space attack for the country.

Which of the statements given above is/are correct?

a) 1 only b) 2 only

c) Both 1 and 2 d) Neither 1 nor 2

Answer: (c)

Explanation: Both statements are correct. The Indian Space Research Organisation (ISRO) has initiated 'Project NETRA (Network for space object Tracking and Analysis)' – an early warning system in space to detect debris and other hazards to Indian satellites. It will give India its own capability in space situational awareness (SSA) like the other space powers — which is used to 'predict' threats from debris to Indian satellites.

It also goes so far as to serve as an unstated warning against missile or space attack for the country.

UN Climate Action Summit 2019

Q5. Consider the following statements in respect of 'UN Climate Action Summit 2019':

1. India has declared programme of scaling up electricity from renewable sources to 175 GW by 2022 and even to 450 GW by 2030.
2. UN Secretary-General, Antonio Guterres has asked countries to bring their action plans to reduce global greenhouse gas emissions by 45% by 2030 and to net zero by 2050.

Which of the statements given above is/are correct?

a) 1 only b) 2 only

c) Both 1 and 2 d) Neither 1 nor 2

Answer: (b)

Explanation: Statement 1 is not correct. India has declared programme of scaling up electricity from renewable sources to 175 GW by 2022 and even to 450 GW later.

Statement 2 is correct. UN Secretary-General, Antonio Guterres has asked countries to bring their action plans by 2020, in line with the objective of reducing global greenhouse gas emissions by 45% by 2030 and to net zero by 2050.

'TB Harega Desh Jeetega' Campaign

Q6. Consider the following statements:

1. India accounted for a quarter of the Global TB burden with an estimated 27 lakh new cases in the year.
2. Further, TB is also leading cause of morbidity and mortality among people living with HIV.

Which of the statements given above is/are correct?

a) 1 only b) 2 only

c) Both 1 and 2 d) Neither 1 nor 2

Answer: (c)

Explanation: Both statements are correct. India accounted for a quarter of the Global TB burden with an estimated 27 lakh new cases in the year. The majority of the affected individuals (89%) were in the age group 15-69.

Further, TB is the leading cause of morbidity and mortality among people living with HIV. 4.9.1 Nearly 25% of all deaths among people living with HIV are estimated to be due to TB.

The Idea of Regional Supreme Court Benches

Q7. Consider the following statements in respect of the idea of regional SC Benches:

1. SC Rules give the Chief Justice of India the power to constitute Benches — he can, for instance, have a Constitution Bench of seven judges in New Delhi, and set up smaller Benches across the country.
2. But there is no provision of setting up of regional benches of SC in the Indian Constitution.

Which of the statements given above is/are correct?

a) 1 only b) 2 only

c) Both 1 and 2 d) Neither 1 nor 2

Answer: (a)

Explanation: Statement 1 is correct. SC Rules give the Chief Justice of India the power to constitute Benches — he can, for instance, have a Constitution Bench of seven judges in New Delhi, and set up smaller Benches in, say, four or six places across the country.

Statement 2 is not correct. According to the experts, this arrangement does not require any amendment to the Article 130 of the Indian Constitution. Its ays that "the Supreme Court shall sit in Delhi or in such other place or places, as the Chief Justice of India may, with the approval of the President, from time to time, appoint".

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SEVEN IMPORTANT FACTS FOR PRELIMS

1. Which public figure has been conferred the 'Dr. Kalam Smriti International Excellence Award 2019'?

–Bangladesh Prime Minister Sheikh Hasina

2. Which state has launched 'Mukhyamantri Dal Poshit Yojana' to provide different varieties of pulses?

–Uttrarakhand

3 Which international body has named minor planet between Mars and Jupiter 2006 VP32 after 'Pandit Jasraj', the doyen of Indian Classical vocal music?

–International Astronomical Union (IAU)

4. What is the name of newly discovered species of frog in Arunachal Pradesh?

–Microhyla eos (commonly known as 'Rice Frogs' or 'Chorus Frogs')

5. Who has been elected as managing director of the International Monetary Fund (IMF), becoming the first head from an emerging market economy?

–Kristalina Georgieva (Bulgarian economist)

6. Who has been conferred the 'Shanti Swarup Bhatnagar award 2019' for outstanding contributions in science and technology?

–Council of Scientific and Industrial Research (CSIR)

7. Who has become the first girl student of the Indian Institute Technology-Madras to win the President of India Prize 'President of India Gold Medal' ?

–Kavitha Gopal

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SEVEN PRACTICE QUESTIONS FOR MAINS EXAM

Q1. "Swachh Bharat Mission" has become the global benchmark for participatory and transformative development." Discuss.

Q2. Recently, Prime Minister of India declared the country open defecation free. Is India truly open defecation free? Critically discuss.

Q3. "There is scope for India-Bangladesh ties to move to the next level, based on cooperation, coordination and consolidation." Discuss.

Q4. “Live as if you were to die tomorrow. Learn as if you were to live forever.” Elaborate.

Q5. Indian economy is going through the demand drought phase and overall slowdown. Discuss the reason behind this.

Q6. Critically discuss the objectives of recently released '10 year Rural Sanitation strategy (2019-2029)'.

Q7. Recently, twenty countries, including India have signed an agreement at the United Nations to stop the spread of fake news online. Discuss the effectiveness of this agreement in order to promote independent and reliable information on the internet.

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SEVEN IMPORTANT NEWS

1. Gandhi Solar Park and Gandhi Peace Garden at UN

To mark the Mahatma Gandhi's 150th birth anniversary, Prime Minister Narendra Modi, along with United Nations (UN) chief Antonio Guterres and other world leaders, has inaugurated the Gandhi Solar Park and Gandhi Peace Garden at the headquarters of the UN. He also underlines that his principles act as a moral compass as the world grapples with challenges of climate change, terrorism and corruption.

About Gandhi Solar Park

The Gandhi Solar Park is a first of its kind symbolic Indian effort at the UN that highlights India's willingness to go beyond the talk on climate change and climate action.

At a contribution of about USD 1 million, India has gifted 193 solar panels that have been installed on the roof of the UN Headquarters, one panel each for every 193 UN member states.

The solar panels are powered up to reach the max of 50 KW of generation power. Energy generated in the park is equivalent to energy that would have been created through the use of 30,000 kilograms of coal. It also has a carbon sequestration of 1000 seedlings which will grow into trees over 10 years.

About Gandhi Peace Garden

The 'Gandhi Peace Garden' is an innovative initiative under which the Consulate General of India in New York, Long Island-based NGO Shanti Fund and the State University of New York - Old Westbury have entered into an agreement to plant 150 trees. It is dedicated in the memory of Gandhi and is a crowd-sourced project, with people adopting trees in the memory of their loved ones. The garden is in an open site within the 600 acres campus of the University.

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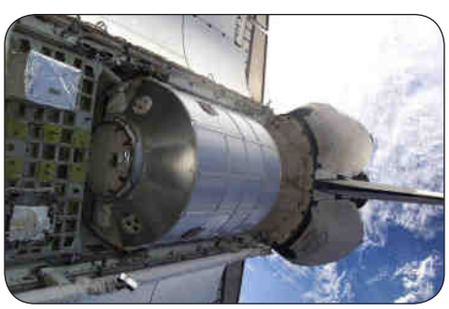
2. LOX Methane Engines

Indian Space Research Organisation (ISRO) is developing two methane-powered rocket engines. Methane, which can be synthesised with water and carbon dioxide in space, is often described as the space fuel of the future. One of the two projects is trying to convert the existing cryogenic engine, which uses liquid hydrogen for fuel, into a LOX methane engine. The other is a smaller engine of 3 tonnes thrust, which will feature an electric motor.



ISRO currently prefers to use a fuel called Unsymmetrical Di-Methyl Hydrazine, along with Nitrogen tetroxide for oxidiser, in its liquid fuel (Vikas) engines, which are used in the lower stages of its rockets, PSLV and GSLV.

Why Methane Engines?

All hydrazine-based fuels, is said to be highly toxic and cancer-causing. Globally, governments are keen on banning hydrazine. Besides, methane beats hydrazine on every other count, too. Apart from being non-toxic, it has a higher specific impulse (which means one kg of the gas can life one kg of mass for a longer time), it is easy to store, does not leave a residue upon burning, less bulky and, importantly, can be synthesised up in space.

Reactive to oxygen: For example, Mars has both water on its land and water in its atmosphere — fuel for a return journey from Mars can be produced right there with these. But on the flipside, methane-fired engines need an igniter to start the fire. Hydrazine fuels are hypergolic, which means they start burning on their own upon coming in contact with oxygen.

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3. Agreement on Fake News at the United Nations

Twenty countries, including France, Britain and India, have signed an agreement at the United Nations (UN) that aims to stop the spread of fake news online. Fake news is the deliberate creation of factually incorrect content to mislead people for some gain.

The agreement was initiated by the Reporters Without Borders (RSF), a press freedom watchdog. The signatories have also committed to promoting independently reported, diverse and reliable information on the internet. The agreement underlines the responsibility of internet providers to promote trustworthy content and pluralism to escape the current information chaos. Recently, several media platforms like Twitter, Facebook have shut down thousands of accounts worldwide for spreading misinformation and spreading propaganda war.

Concerns

The emergence of a global digital space is shaking up the world of information, bringing with it progress as well as risks. Fake news is now a mounting problem as fraudsters and anti-social elements use social media platforms to target people. Factual news is increasingly getting buried in an avalanche of incorrect information with potential to create rifts between communities, castes and religions.

Fake news is becoming an increasingly serious problem. It is viewed as a serious threat to the democratic process.

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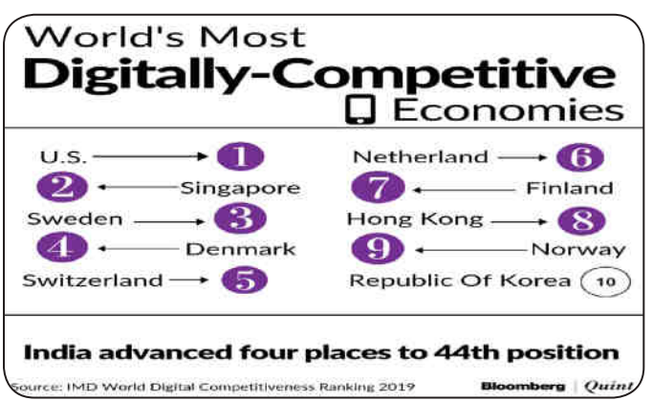
4. World Digital Competitiveness Ranking 2019

The IMD World Digital Competitiveness Ranking 2019 (WDCR 2019) measured the readiness and capacity of 63 economies to adopt digital technologies. It gave its ranking based on the digital exploration skills of the economies for economic transformation in governance, business and society. To evaluate an economy, WDCR examined three factors: Knowledge - the capacity to understand and learn the new technologies; Technology - the competence to develop new digital innovations and Future readiness - the preparedness for the coming developments.

However, this year, two new variables related to robotics were introduced. These are 'industrial robot' to measure the total number of robots in operation, and 'robots in education and R&D' worldwide. The data is provided by the International Federation of Robotics.



Key Highlights

The US was ranked as the world's most digitally competitive economy, followed by Singapore, Sweden, Denmark and Switzerland.

In the top 10, the Netherlands, Hong Kong and Republic of Korea moved up (to 6th, 8th and 10th, respectively), while Norway dropped to 9th and Canada fell from 8th to 11th.

India's Performance

India rose from 48th place in 2018 to 44th rank this year as the country has improved overall in all factors - knowledge, technology and future readiness - as compared to the previous year's ranking.

This progress is supported by positive results in talent, training and education as well as the enhancement of technological infrastructure.

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5. 'Tiki Mausi' Mascot

With an aim to spread awareness about child and woman's nutrition, the government of Odisha in collaboration with the United Nations Children's Fund (UNICEF) has launched a comprehensive communication strategy and unveiled a mascot 'Tiki Mausi'.

Key Highlights

'Tikki Mausi' will change the behaviour of common people and make them aware about child and woman's

nutrition and evelopment in every household. The mascot has been named as 'Tikki Mausi' in reference to the second mother of a child. It is projected to spread awareness for better health care of children and their development.

The mascot will also take care of providing the right information about government projects for women and children to every household for better future of the children in the state.

About UNICEF

UNICEF was created by the United Nations General Assembly in 1946.

It is a special program of the United Nations (UN) devoted to aiding national efforts to improve the health, nutrition, education, and general welfare of children.

UNICEF is working in over 190 countries and territories to save children's lives, to defend their rights, and to help them fulfil their potential, from early childhood through adolescence.

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6. Forest-PLUS 2.0

US Agency for International Development (USAID) and India's Ministry of Environment, Forest and Climate Change (MoEF&CC) has officially launched 'Forest-PLUS 2.0.' 'Forest-PLUS 2.0' comprises pilot project in three landscapes — Gaya in Bihar, Thiruvananthapuram in Kerala and Medak in Telangana. The choice of these sites was driven by the contrast in their landscapes – Bihar is a forest deficit area, Telangana is a relatively drier area where there is ample scope for community livelihood enhancement and Kerala is rich in biodiversity.

The targets of this set are - 1,20,000 hectares of land under improved management, new, inclusive economic activity worth $12 million and measurable benefits accrued to 800,000 households.

To achieve these targets, the programme has three focal points of action. These are developing tools for multiple services in forests management, developing incentive-based instruments for leveraging finance and unlocking economic opportunities for forest-dependent people by modelling and setting up conservation enterprises and mobilising investment from the private sector.

Background

'Forest-PLUS 2.0,' the second set of pilot projects, is meant to enhance sustainable forest landscape management after 'Forest-PLUS' completed its five years in 2017. The programme's first set focused on capacity building to help India participate in Reducing Emissions from Deforestation and forest Degradation (REDD+). It included four pilot projects in Sikkim, Rampur, Shivamogga and Hoshangabad.

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7. International Speed Post to New Six Countries

The Department of Posts has announced commencing of International Speed Post Service (EMS) to Bosnia and Herzegovina, Brazil, Ecuador, Kazakhstan, Lithuania and North Macedonia. The EMS service to these countries will henceforth be available at major post offices across India. India Post currently provides speed post service to 100 countries, as per the information available on its website.

About EMS

Express Mail Service (EMS) is a premium service that enables its users to send documents and merchandise faster and with the added facility of being able to track the movement of the item on the internet. This facility is expected to augment people to people contact with these countries and foster trade as EMS is popular channel for small and medium enterprises.

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SEVEN IMPORTANT HIGHLIGHTS FROM PIB

1. INS Khanderi

Union Defence Minister Rajnath Singh has commissioned the 'INS Khanderi,' making it the second Scorpene-class submarine to join the submarine arm of the Indian Navy. Khanderi was first put to sea on June 1, 2017. Since then, it has since undergone comprehensive sea trials.

Key Highlights

'INS Khanderi' is the second of Kalvari Class diesel electric attack submarines of the Indian Navy. It has been built in India to the French Scorpene design and is the second submarine of the 'Project-75'. The Indian Navy had taken up the production of six Kalvari class (Scorpene) diesel-electric attack submarines (SSKs) under 'Project 75'. The 'P-75' submarine is a well-proven technology and their indigenization effort reduces its operating cost in the long term.

'INS Khanderi' is the follow-on to 'INS Kalvari,' which was the first of the French origin Scorpene class submarines being indigenously constructed in India and commissioned in 2017.

The submarine's undersea warfare capability comprises a cluster of integrated advanced weapons and sensors. The sonar suite enables long range detection and classification. When identified, 'INS Khanderi' may choose to engage the enemy by utilising either missiles or torpedoes.

The name Khanderi is inspired by the dreaded 'Sword Tooth Fish' a deadly fish known to hunt whilst swimming close to the bottom of the ocean. Khanderi is also name of an island fort built by great Maratha ruler Chhatrapati Shivaji Maharaj.

2. 10 Year Rural Sanitation Strategy (2019-2029)

The Department of Drinking Water and Sanitation (DDWS), Ministry of Jal Shakti has launched the 10 Year Rural Sanitation Strategy (2019-2029). It will focus on sustaining the sanitation behavior change that has been achieved under the 'Swachh Bharat Mission-Grameen' (SBM-G), ensuring that no one is left behind, and increasing access to solid and liquid waste management.

Key Highlights

This strategy has been prepared by DDWS, in consultation with state governments and other stakeholders and it lays down a framework to guide local governments, policy makers, implementers and other relevant stakeholders in their planning for Open Defecation Free Plus (ODF+), where everyone uses a toilet and every village has access to solid and liquid waste management.

This strategy focuses on the need for states/UTs to continue their efforts to sustain the gains of the mission through capacity strengthening, information, education and communication (IEC), organic waste management, plastic waste management, grey water management and black water management. The strategy also speaks about potential collaborations with development partners, civil society and inter-government partnerships. It also highlights innovative models for sanitation financing.

About ODF, ODF+ and ODF++ Status

ODF : An area can be notified/declared as ODF if at any point of the day, not a single person is found defecating in the open.

ODF+ : An area can be notified/declared as ODF+ if at any point of the day, not a single person is found defecating and/or urinating in the open and all community and public toilets are functional and well maintained.

ODF++ : An area can be notified/declared as ODF++ if at any point of the day, not a single person is found defecating and/or urinating in the open, all community and public toilets are functional and well maintained, and faecal sludge/ septage and sewage is safely managed and treated, with no discharging and/or dumping of untreated faecal sludge/ septage and sewage in drains, water bodies or open areas.

3. First Indigenous Fuel Cell System

The President of India has unveiled the first indigenous 'High Temperature Fuel Cell System' developed by Council of Scientific and Industrial Research (CSIR) in partnership with Indian industries under India's flagship program named "New Millennium Indian Technology Leadership Initiative (NMITLI)".

The fuel cells developed are based on 'High Temperature Proton Exchange Membrane' (HTPEM) technology. The development is most suitable for distributed stationary power applications like; for small offices, commercial units, data centers etc.; where highly reliable power is essential with simultaneous requirement for air-conditioning.

Significance

- This system will meet the requirement of efficient, clean and reliable backup power generator for telecom towers, remote locations and strategic applications as well.
- This development would replace Diesel Generating (DG) sets and help reduce India's dependence on crude oil.
- The developed technology is world class and the development has placed India in the league of developed nations which are in possession of such a knowledge base.
- In the field of clean energy, fuel cell distributed power generation systems are emerging as promising alternative to grid power. The fuel cells fit well in India's mission of replacing diesel with green and alternate fuels.
- The development of fuel cell technology is indigenous and carries immense national importance in terms of non-grid energy security.

4. Sardar Patel National Unity Award

Government of India has instituted the highest civilian award in the field of contribution to the unity and integrity of India, in the name of Sardar Vallabhbhai Patel.

Key Highlights

The Award would consist of a medal and a citation. No monetary grant or cash award would be attached to this Award. Not more than three Awards would be given in a year. It would not be conferred posthumously except in very rare and highly deserving cases.

The Award seeks to recognize notable and inspiring contributions to promote the cause of national unity and integrity and to reinforce the value of a strong and united India. The award will be announced on the occasion of the National Unity Day, i.e. the birth anniversary of Sardar Patel on 31st October. The Award shall be conferred by the President by a Sanad under his hand and seal and presented by him in a presentation ceremony along with the Padma award presentation ceremony held in Rashtrapati Bhawan.

All citizens, without distinction of religion, race caste, gender, place of birth, age or occupation, and any institution/ organization would be eligible for the Award.

Any Indian national or institution or organization based in India would be able to nominate an individual for consideration for this Award. Individuals may also nominate themselves. State governments, UT Administrations and ministries of government of India may also send nominations.

The Prime Minister would be tasked with constituting the award committee comprising the Cabinet Secretary, the Principal Secretary to the Prime Minister, the Secretary to the President and the Home Secretary. Three to four eminent persons selected by the Prime Minister would also be made part of the committee.

5. First ever high-level meeting on Universal Health Coverage

The first-ever United Nations General Assembly high-level meeting on universal health coverage was held on 23 September 2019. This meeting, held under the theme "Universal Health Coverage: Moving Together to Build a Healthier World". It aims to accelerate progress toward universal health coverage (UHC), including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. It also aimed at mobilizing the global community to secure political commitment from Heads of State and Government to accelerate progress toward achieving universal health coverage by 2030.

India's Performance

Prime Minister of India has highlighted the bold steps taken by India to achieve Universal Health Coverage. He said that health does not simply mean freedom from diseases. A healthy life is every person's right. The onus for this is on governments to ensure this.

India has taken a holistic approach towards this subject and is working on four main pillars of healthcare. These are preventive healthcare, affordable healthcare, improvements on the supply side and implementation in mission mode. India has rolled out the world's largest health insurance scheme- Ayushman Bharat. Under this scheme, 500 million poor have been given the facility of free treatment worth up to 500,000 rupees annually (more than USD$7000). There are more than 5000 Special Pharmacies, where more than 800 varieties of vital medicines are available at affordable prices.

India is also commited to eliminate Tuberculosis by 2025, five years ahead of the global goal of 2030. India's efforts are not limited to its boundaries. India has helped to provide access to affordable health care including by way of tele-medicine to several other countries, especially African countries.

6. India - CARICOM

India's historic and warm relations with the countries of the Caribbean witnessed a new momentum with the meeting of Prime Minister of India Narendra Modi with 14 leaders of the Caribbean Community (CARICOM) group of countries on the sidelines of the United Nations General Assembly in New York.

Key Highlights

It was the first-ever meeting of PM Modi with CARICOM leaders in a regional format and highlighted the steadily intensifying and deepening relations between India and partner countries of the Caribbean, not only in the bilateral, but also in the regional context.

India has announced a USD 14 million grant for community development projects in the CARICOM and another 150 million Line of Credit for solar, renewable energy and climate- change related projects.

India will set up the Regional Center for Excellence in Information Technology in Georgetown, Guyana and the Regional Vocational Training Center in Belize by upgrading the existing India-funded centers in these countries. The Indian side also expressed support to specialized capacity building courses, training and deputation of Indian experts based on the needs and requirements of the CARICOM countries.

India also invited CARICOM countries to join the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure.

About CARICOM

CARICOM was formed in 1973 by the Treaty of Chaguaramas. It has 15 members – Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St Lucia, St. Vincent and the Grenadines, Suriname and Trinidad & Tobago.

CARICOM's main purposes are to promote economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy.

7. World Tourism Day

World Tourism Day is celebrated every year on 27 September by the United Nations World Tourism Organization (UNWTO) since 1980. The aim of the day is to raise awareness about the role of tourism and to focus on the fact that travelling has a major social, cultural, political and economic effect on all of our lives.

Key Highlights

UNWTO has chosen India as the host country to observe World Tourism Day 2019. The theme for this World Tourism Day was 'Tourism and Jobs: A better future for all'.

Tourism is a major engine of economic growth and an important source of employment and foreign exchange earnings in many countries. Further, tourism in India has tremendous potential, considering the country's rich cultural and historical heritage, varied ecology, terrains and places of natural beauty spread across the country.

India had been placed at 34th position out of 140 economies, in the World Economic Forum's 'World Travel and Tourism Competitiveness Rank' in 2019.

The Indian government is continuously taking tourist friendly decisions like reduction of e-tourist visa fees, making available an extended e-tourist visa, reduction in GST on hotel tariffs being some of the recent important ones which will go a long way in giving boost to tourism in the country.

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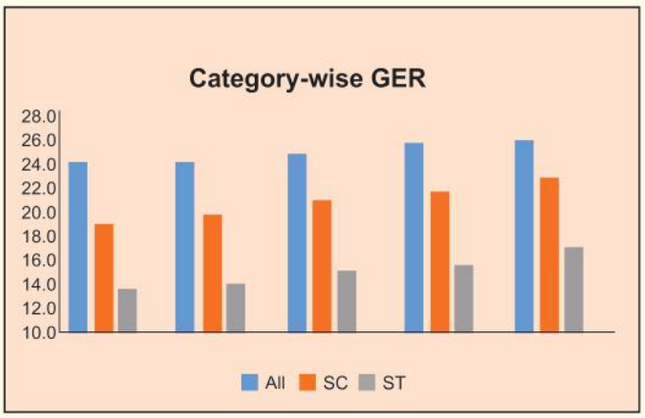
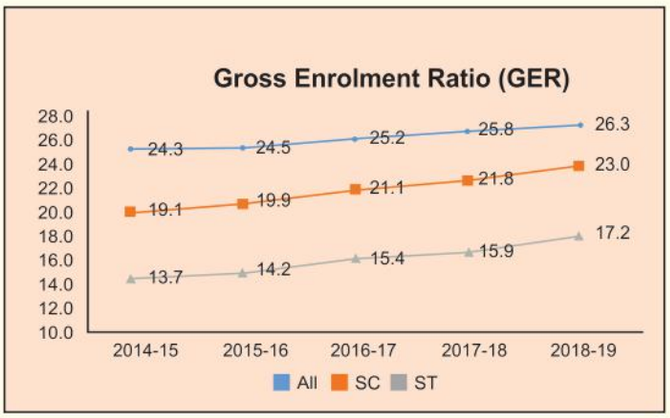
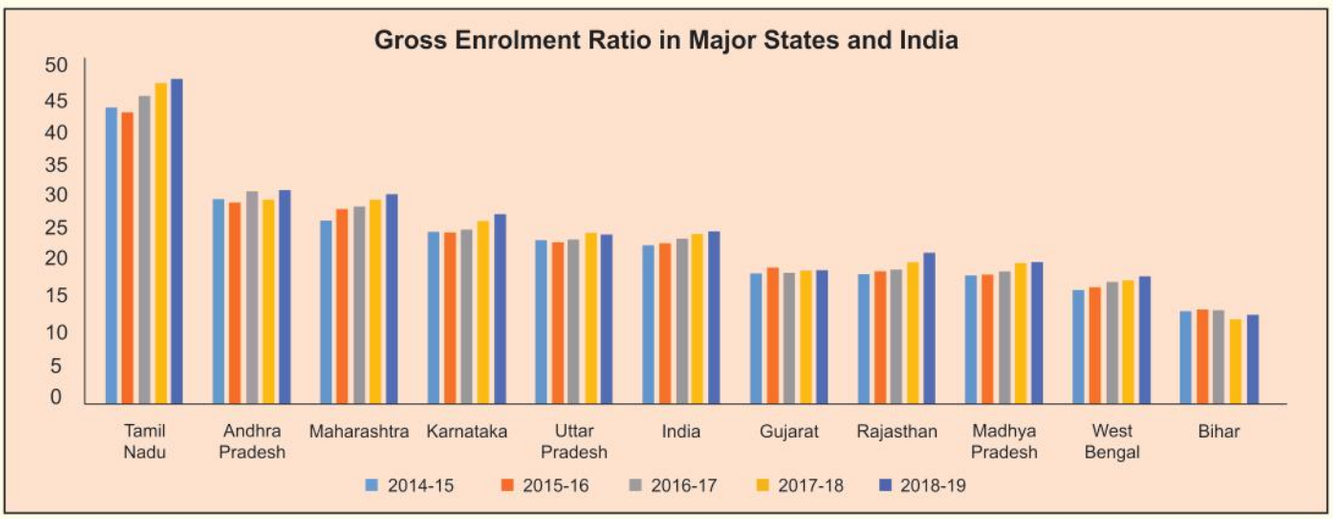
SEVEN IMPORTANT CONCEPTS THROUGH GRAPHICS

1. Trend in Gross Enrolment Ratio



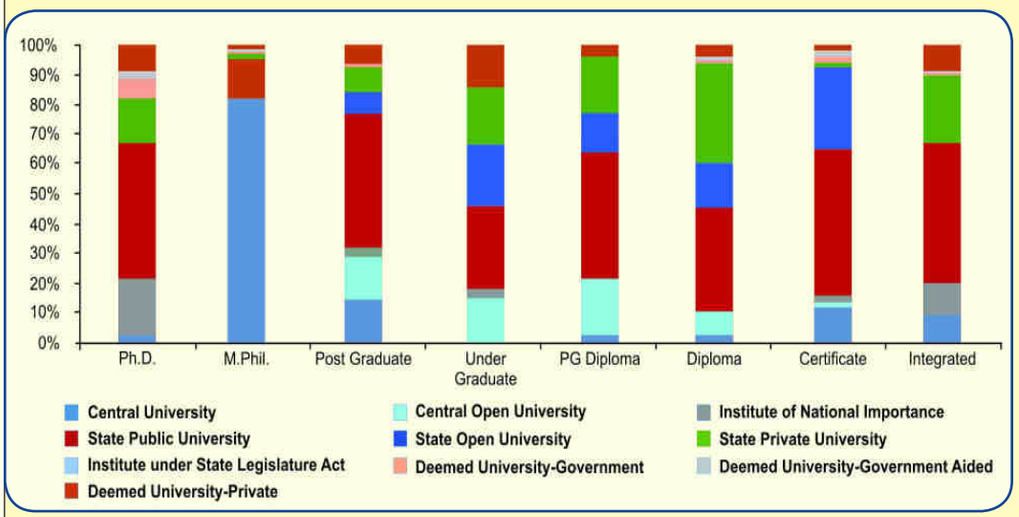




- Total enrolment in higher education has been estimated to be 37.4 million with 19.2 million male and 18.2 million female. Female constitute 48.6% of the total enrolment.
- Gross Enrolment Ratio (GER) in Higher education in India is 26.3%, which is calculated for 18-23 years of age group. GER for male population is 26.3% and for females, it is 26.4%.
- The enrolment has grown considerably during the last 5 years, which has increased from 3,42,11,673 in 2014-15 to 3,73,99,388 in 2018-19. The overall growth is 9.3%.
- Enrolment in various types of universities including enrolment in their constituent units has also increased over the years. The increase is quite high in central open university, private university and state open universities.
- GER varies considerably in different states, although it has generally increased in all the states. However, Uttar Pradesh comes at number one with the highest student enrolment followed by Maharashtra and Tamil Nadu.

2. Level-wise Enrolment in different types of Universities

Key Facts

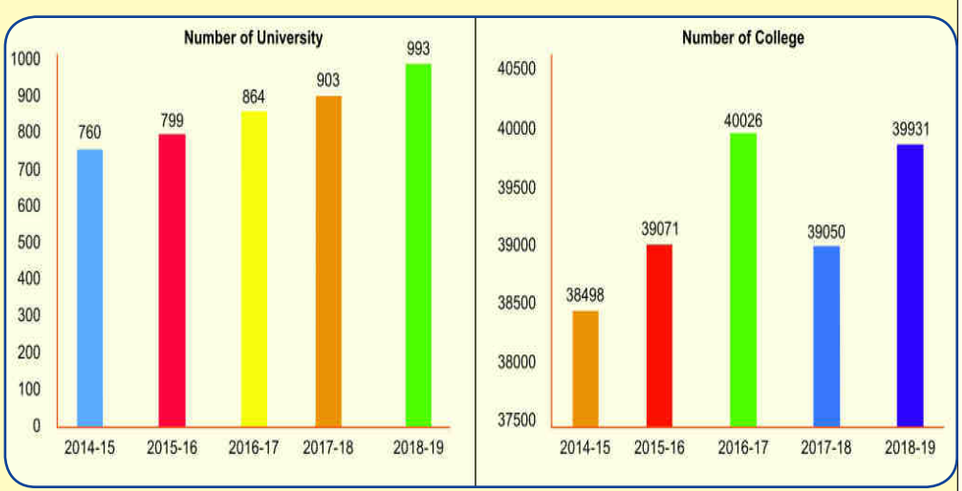


- There are 11 types of universities in India.
- About 79.8% of the students are enrolled in Undergraduate level programme. 1,69,170 students are enrolled in Ph.D. that is less than 0.5% of the total student enrolment.
- Maximum numbers of students are enrolled in B.A. programme followed by B.Sc. and B.Com. programmes. 10 Programmes out of approximately 187 cover 80.3% of the total students enrolled in higher education.
- At Undergraduate level the highest number (35.9%) of students are enrolled in Arts/Humanities/Social Sciences courses followed by Science (16.5%), Engineering and Technology (13.5%) and Commerce (14.1%).
- At Ph.D. level, maximum number of students are enrolled in Science stream followed by Engineering and Technology. On the other hand at Post Graduate level maximum students are enrolled in Social Science stream and Management comes at number two.

3. Growth in Number of Higher Educational Institutions

Key Facts

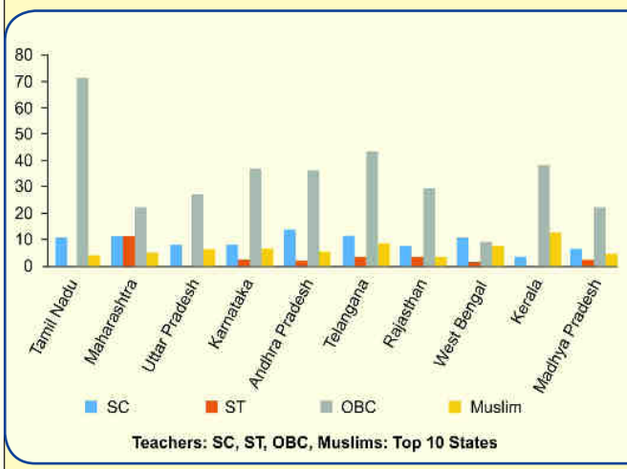
- The number of universities and similar institutions listed on All India Survey on Higher Education (AISHE) portal has increased from 760 in 2014-15 to 993 in 2018-19 by almost 30.7%. Whereas the number of colleges has increased from 38498 in 2014-15 to 39,931 in 2018-19 by about 3.7%.
- There are 993 universities, 39931 colleges and 10725 stand alone institutions listed on AISHE web portal and out of them 962 universities, 38179 colleges and 9190 stand alone institutions have responded during the survey. 298 universities are affiliating i.e. having colleges.



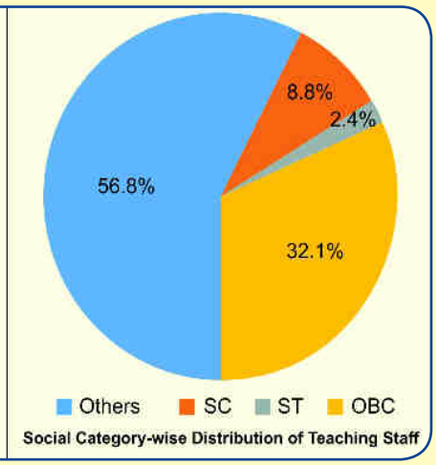
- 385 universities are privately managed and 394 universities are located in rural area. 16 universities are exclusively for women, 3 in Rajasthan, 2 in Tamil Nadu & 1 each in Andhra Pradesh, Assam, Bihar, Delhi, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Odisha, Uttarakhand and West Bengal.
- In addition to 1 central open university, 14 state open universities and 1 state private open university, there are 110 dual mode universities, which offer education through distance mode also and the maximum 13 of them are located in Tamil Nadu.
- There are 548 general, 142 technical, 63 agriculture & allied, 58 medical, 23 law, 13 sanskrit and 9 language universities and rest 106 universities are of other categories.

4. Teaching Position

Key Facts



Teachers: SC, ST, OBC, Muslims: Top 10 States



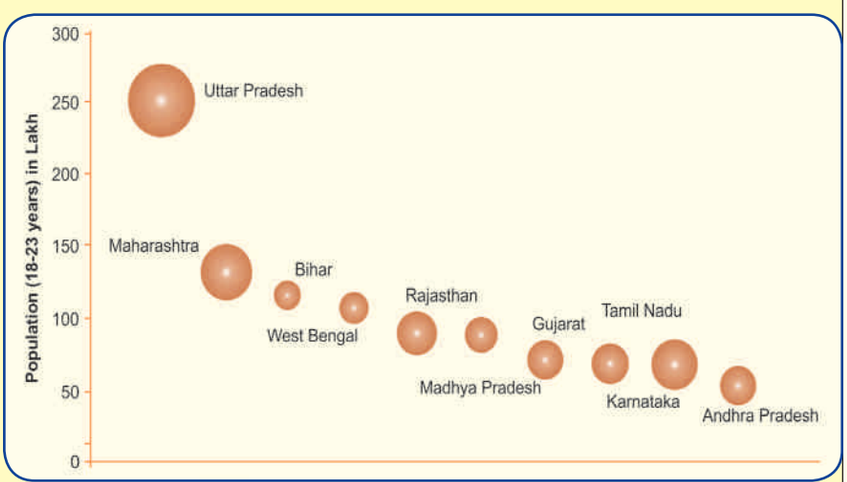
Social Category-wise Distribution of Teaching Staff

- The total number of teachers are 14,16,299, out of which about 57.8% are male teachers and 42.2% are female teachers. At All-India level there are merely 73 female teachers per 100 male teachers.
- The lowest gender proportion is recorded in Bihar where female to male teachers' ratio is 1:4 which in percentage terms is 78.97% for male and only 21.03% for female teachers.
- Jharkhand comes close second with 69.8% male teachers and 30.2% female teachers. Uttar Pradesh has 32.3% female teachers of the total teachers in the state. A few states like Kerala, Punjab, Haryana, Chandigarh, Meghalaya, Nagaland, Delhi and Goa on the other hand have more female teachers than male teachers.
- At All-India level, teachers belonging to General category are more than half, i.e. 56.7% of the total number of teachers in India Other Backward Castes (OBC) follows with 32.1%; while Schedule Castes (SC) and Schedule Tribes (ST) with 8.8% and 2.36% respectively. About 5.4% teachers come from Muslim minority group and 9.2% are from other minority groups.
- Out of the 10 major states, the leading three are Andhra Pradesh with 13.83% SCs and 1.6%STs, Maharashtra with 11.39% SCs and 1.52% STs and Telangana with 11.17% SCs and 3.5% STs, teachers.

5. College Density

Key Facts

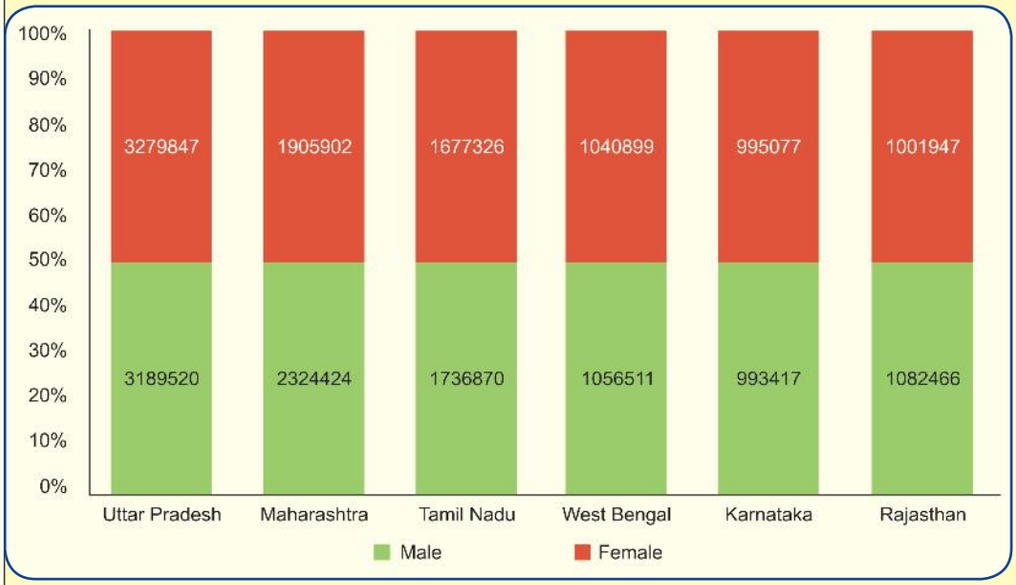
- College density, i.e. the number of colleges per lakh eligible population (population in the age-group 18-23 years) varies from 7 in Bihar to 53 in Karnataka as compared to All-India average of 28.
- Most of the colleges run only Under Graduate level programmes. Only 2.5% of colleges run Ph.D. level programmes and 34.9% of colleges run Post Graduate Level programmes.
- The top 8 states in terms of highest number of colleges in India are Uttar Pradesh, Maharashtra, Karnataka, Rajasthan, Haryana, Tamil Nadu, Gujarat and Madhya Pradesh.
- Bangalore Urban district tops in terms of number of colleges with 880 colleges followed by Jaipur with 566 colleges. Top 50 districts have about 32.2% of colleges.



- There are 34.8% colleges, which run only single programme, out of which 83.1% are privately managed. Among these privately managed colleges, 38.1% colleges run B.Ed. Courses only.
- 77.8% colleges are privately managed; 64.3% private-unaided and 13.5% private-aided.
- Andhra Pradesh & Uttar Pradesh have about 88% private-unaided colleges and Tamil Nadu has 87% private-unaided colleges, whereas, Assam has 16.0%.
- 16.3% of the colleges are having enrolment less than 100 and only 4% colleges have enrolment more than 3000.

6. Gender Distribution

Key Facts

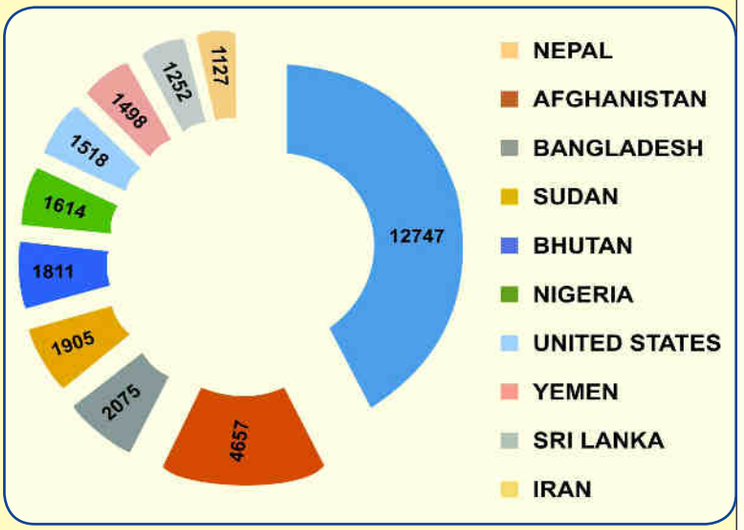


- The relatively higher share of male enrolment than female enrolment of students is also seen across the levels in the most of the states. The top 6 states in terms of highest total student enrolment are Uttar Pradesh, Maharashtra, Tamil Nadu, West Bengal, Rajasthan and Karnataka.
- It is interesting to note that these 6 states with highest student enrolment constitute nearly 54.23% of the total student enrolment in India. Rest of the 30 states (including UTs) have only 25.76% of the total student enrolment.
- So inevitably, the female students in these 6 states is almost 54.43% of the total female students enrolled and male students enrolled in these 6 states contributes to 54.05% of the total male students across India.
- Uttar Pradesh, with its highest student enrolment in India, has 49.30% male and 50.70% female students. Maharashtra has the second highest student enrolment with approx. 54.95% male and approx. 45.05% females. Thereafter, Tamil Nadu has 50.87% male and 49.13% female, West Bengal with 50.37% male and 49.63% female students. In Karnataka, percentage of females enrolled is 50.04% whereas in Rajasthan more male students are enrolled as compared to female students.

7. Representation of Foreign Students

Key Facts

- The total number of foreign students enrolled in higher education is 47,427.
- The foreign students come from 164 different countries from across the globe. The top 10 countries constitute 63.7% of the total foreign students enrolled.
- Highest share of foreign students come from the neighbouring countries of which Nepal is 26.88% of the total, followed by, Afghanistan (9.8%), Bangladesh (4.38%), Sudan (4.02%), Bhutan (3.82%), Nigeria (3.4%), United States of America (3.2%), Yemen (3.2%), Sri Lanka (2.64%) and Iran (2.38%).
- The highest number of foreign students are enrolled in Undergraduate courses, that is, 73.4% of the total foreign students, followed by Post Graduate with about 16.15% enrolment.
- Enrolment in rest of the levels constitutes 10.4%. Foreign male students are higher in almost all the levels.



- Looking at the state-wise distribution, it can be seen that Karnataka has the highest number of students coming from foreign countries which is 10023. Apart from Karnataka, Maharashtra (5003), Punjab (4533), Uttar Pradesh (4514), Tamil Nadu (4101), Haryana (2872), Delhi (2141), Gujarat (2068) and Telangana (2020), reflects more than 2,000 foreign students.

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AN INTRODUCTION

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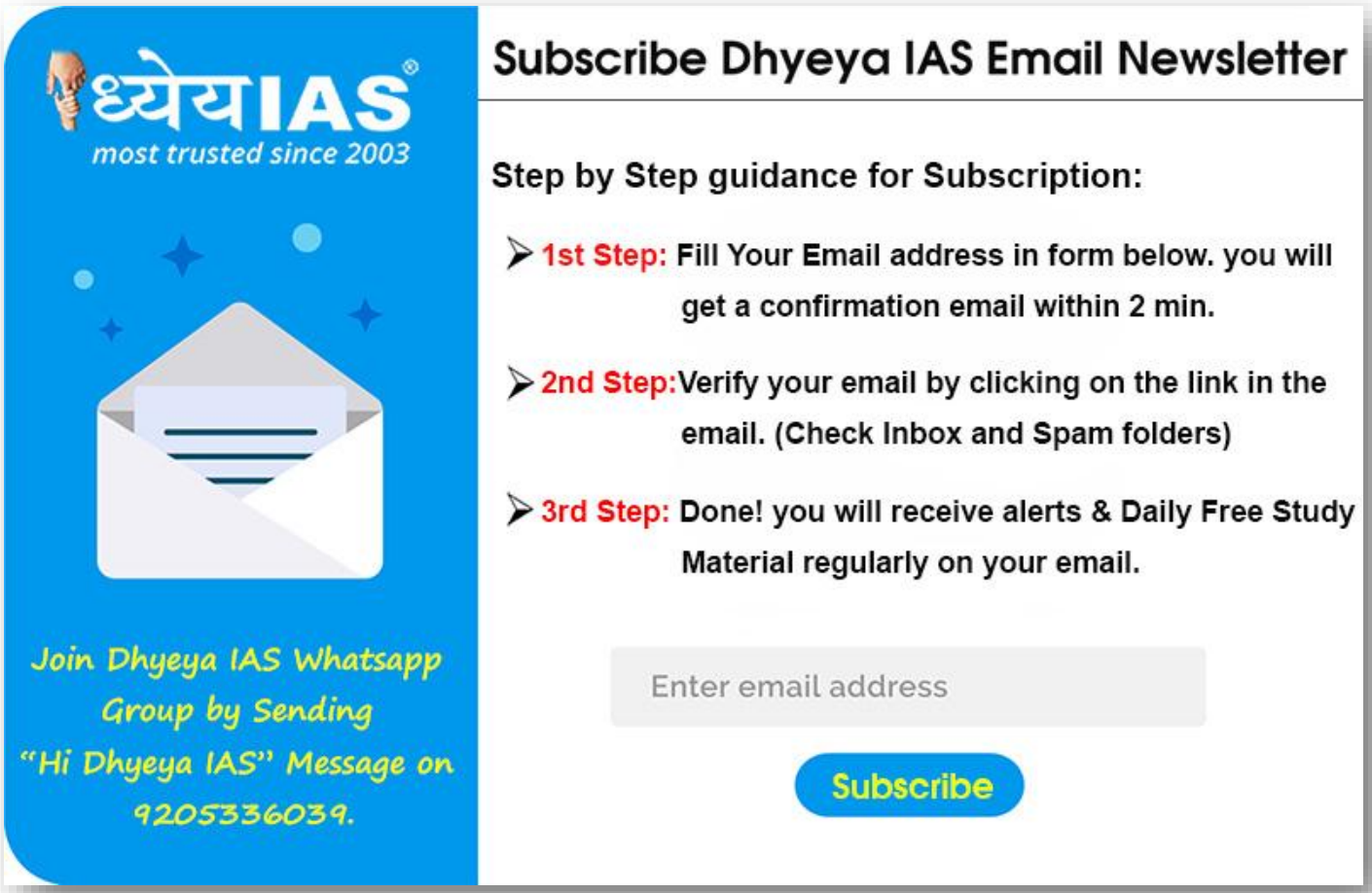
नोट (Note): अगर आपको हिंदी और अंग्रेजी दोनों माध्यम में अध्ययन सामग्री प्राप्त करनी है, तो आपको दोनों में अपनी ईमेल से Subscribe करना पड़ेगा | आप दोनों माध्यम के लिए एक ही ईमेल से जुड़ सकते हैं |



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